

SPECIFICATIONS/規格

Fuselage Length/機身全長	48.03" (1220mm)
Fuselage Width/寬度	5.51" (140mm)
Total Height/高度	15.74" (400mm)
Main Rotor Dia./主旋翼直徑	52.95" (1345mm) 54.53" (1385mm)
Tail Rotor Dia./尾旋翼直徑	9.33" (237mm)
Gear Ratio/齒輪比	8.5:1:4.56
Full Equipped Weight/全配重量	7.5 lbs (3400g)

THUNDER TIGER CORP. www.thundertiger.com

JK6081-V2

RAPTOR 50 Titan SE



MANUAL

50級3D直昇機組裝說明書

ASSEMBLY & MAINTENANCE

INTRODUCTION 前言

Thank you very much for purchasing the Thunder Tiger Raptor 50 Titan SE R/C helicopter. The design of Raptor 50 Titan SE is based on the original Raptor 50 series helicopter and modified for extreme aerobatics. All those must-have optional parts for 3D flying are included, such as metal main rotor hub, non-linear flapping dampers, 3D light paddles, push-pull control linkage, metal pulley, carbon vertical fin…etc. The modified rotor head delivers +/-15° collective pitch. Non-linear flapping damper and positive delta 3 angle give sharp response. While high quality material makes the helicopter one tough machine able to handle everyday 3D beating. Raptor 50 Titan SE was born for 3D flying, and you don't have to do any further modification for aggressive 3D maneuvers. This is by far the best machine you have ever seen. Just enjoy the model and have fun.

感謝您選購雷虎科技翼手龍50 Titan SE版本直昇機，翼手龍50 Titan SE是市售其他同級3D直昇機中的最佳選擇！此款版本是雷虎科技研發團隊根據翼手龍50 Titan SE版本再次進化而成的創新產品，優異性能使飛行動作更加乾淨俐落，能充份實現3D飛行愛好者所有夢寐以求的特技動作。強烈建議您，請務必詳細閱讀本說明書後，再開始進行組裝及使用本產品，閱讀完畢後請您妥善保存本說明書以為往後直昇機進行調整或維修時使用。

CONTENTS 目錄

WARNING 警告事項

This radio controlled helicopter is not a toy. It is a sophisticated piece of equipment and is designed for hobby use only. If not properly assembled and operated, it is capable of causing property damage and bodily harm to both the operator and spectators. Thunder Tiger and its duly authorized distributors assume no liability for damage that could occur from the assembly or operation of this product.

1. 本產品非玩具且具有相當程度的危險性，不當的組裝、調整或操控皆會導致自己或他人身體嚴重的傷害。當上述原因造成傷害事件時，製造商是得以免除責任的。因此請您在初次進行遙控直昇機飛行前，務必請教有經驗的飛行同好或銷售店家，以獲得最正確的組裝、調整資訊及飛行指導，以確保飛行安全。
2. 遙控模型使用的燃料具有相當高的揮發性以及低燃點的特質，當您於使用以及儲存時都必須相當注意使用燃油的相關規定：使用時必須遠離火源，儲存時必須放置在乾燥陰涼、遠離日照以及兒童不易取得的地方。
3. 模型引擎發動時所排放的廢氣可能會對身體產生相當程度的傷害，所以請避免於室內場所啓動引擎，並請在通風狀況良好的場所進行操作。
4. 遙控模型的儲放必須遠離高溫、日照、以及潮濕的場所，以避免機件損壞或是因而發生火災的危險。

AMA INFORMATION 遙控模型協會

Operating a model helicopter requires a high degree of responsibility and skill. If you are a newcomer to the hobby, it is best to seek help and guidance from accomplished model helicopter pilots. This will greatly speed up the learning process and have you flying successfully in a reasonable amount of time. We also would strongly urge you to join the Academy of Model Aeronautics. The AMA is a non-profit organization that provides its members with a liability insurance plan as well as monthly magazine entitled Model Aviation. All AMA charter aircraft clubs require all pilots to hold a current AMA sporting license prior to operation of their models at club fields. For further information, contact the AMA at:

Academy of Model Aeronautics 5151 East Memorial Drive Muncie, IN 47302 (317) 287-1256

操控遙控直昇機需要非常細膩的操作技巧，如果您是初次接觸遙控模型直昇機的初學者，建議您加入當地的的遙控模型協會，或與您購買直昇機的店家一同進行飛行活動，以習得操作技巧、初級維修及調整的經驗，確保您的遙控模型運動順利安全進行。
部分遙控模型協會亦提供了飛行場的飛行意外險，使您在飛行時能無後顧之憂，並同時提供週遭的群衆最基本的安全保障。

FLIGHT SAFETY CHECKLIST　飛行安全檢查事項

◎ Make sure both the transmitter and receiver batteries are fully charged prior to operating the helicopter.
◎ Make sure all flight controls operate properly prior to flying.
◎ Range check the radio before the first flight. The servos must operate properly with the transmitter antenna collapsed (or 2.4G radio system power reduction testing) at a range of at least 150 ft. (50 meters).
◎ Check to make sure there is no radio interference on your radio freguency before operating the helicopter.
◎ Use only the recommended engine fuel as specified by the engine manufacturer.
◎ Make sure the transmitter and receiver are turned on before starting the engine.
◎ The engine throttle must be in the idle position before starting the engine.
◎ Model helicopter main and tail rotors operate at very high RPM. Make sure nothing can come in contact with the rotor blades during flight.
◎ After starting the helicopter, maintain a safe distance during the flight.
◎ Never operate the helicopter in rain or excessive wind conditions.
◎ Always operate and fly your helicopter in a safe and responsible manner.
◎ Never fly a model helicopter over other pilots, spectators, cars, or anything that could result in injury or property damage.

◎ 每次飛行前確定您的接收以及發射機電池的電源是否能滿足飛行需求。
◎ 每次飛行前確定直昇機的各項動作方向及行程是否正常。
◎ 開機時必須遵守先開發射機後開接收機的順序，關機時需遵守先關接收機後關發射機的順序，並應養成習慣，時時遵守。不正確的開、關機，可能發生失控現象，造成自身以及他人身體的傷害。
◎ 飛行前需確認是否有相同頻率的同好進行飛行，相同頻率的發射機一同開機將導致失控發生。
◎ 請使用引擎製造商推薦的燃油。
◎ 每次飛行前需要檢查所有的連桿頭是否鬆脫，鬆脫的連桿頭將導致直昇機失控發生。
◎ 啓動前需確認發射機電源開啓，接收機動作正常，以免發生引擎無法控制的危險。
◎ 啓動引擎前必須詳細確認發射機的油門位置是否處於低速？熄火降落開關是否關閉？定速開關(Idle)是否關閉？啓動時將油門處於高速位置將對自身產生危險。
◎ 主旋翼與尾旋翼動作時轉速相高，必須確認飛行時不會有接觸主/尾旋翼的情形發生。
◎ 飛行時隨時注意與直昇機保持安全距離。
◎ 避免於雨天、強風中飛行，以免發生無法控制的情形。
◎ 作為一個稱職的遙控直昇機飛行員，必須要有安全的觀念與負責任的態度。
◎ 飛行的高度必須遠離載人飛行器的高度與空域，同時必須避免接近車輛與圍觀的人員。

POST FLIGHT INSPECTION　飛行前檢查項目

◎ Inspect the model thoroughly to insure no parts have come loose or become damaged during the flight and landing. Replace damaged parts and tighten loose screws before flying again.
◎ Pump out any remaining fuel from the fuel tank.
◎ Wipe off excess oil and fuel from helicopter body and other exposed parts.
◎ Lubricate all moving parts to ensure smooth operation for the next time you fly.
◎ Store model in a cool, dry place. Avoid storage in direct sunlight or near a source of heat.
◎ Replace any loose ball links and damaged bearings.

◎ 每次飛行前需要詳細的檢查是否有鬆脫或是損毀的零件，若有則必須立即終飛行，鎖緊鬆脫的零件以及更換損壞的零件。
◎ 飛行後抽光燃油箱中的燃油。
◎ 飛行後妥善的清潔機體上（所有外露部分）殘餘的燃油。
◎ 為了下一飛行，請確認所有的可動零件均可順暢動作。
◎ 儲存您的愛機在乾燥、陰涼、通風的地方，避免陽光直射以及遠離熱源。
◎ 更換所有鬆脫球頭連及損壞軸承。

CAUTION: In the event the model has crashed, inspect the flybar, rotor shaft and the blade spindle to make sure they are not bent. If any item is damaged, it must be replaced with a new part to ensure safe operation. Do not glue any broken or damaged plastic parts. Do not repair broken rotor blades. Always inspect the following items immediately:

警告:當直昇機發生墜機後，請先檢查穩定翼、主軸及旋翼固定軸是否已變形，任一零組件損壞均需更換新品以確保飛行安全。請勿嘗試修復任何已損壞的塑膠零件、旋翼槳片。
接著請立即檢查下列零組件：

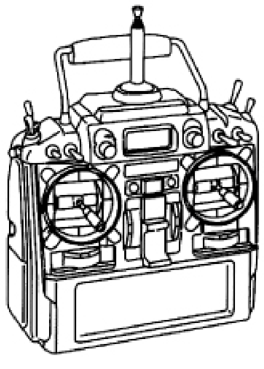
◎ Engine starting shaft.
◎ All gears, Ball links, Link rods, bearings.
◎ Main shaft, flybar and blade spindle.
◎ Tail boom and support.
◎ Vertical and horizontal fins.
◎ Tail rotor shaft and control system.
◎ Main and tail rotor blades.

◎ 引擎啓動接頭及軸組
◎ 全部的齒輪、球頭連桿、操控環及軸承
◎ 主軸、穩定翼及旋翼固定軸
◎ 尾管及支撐架
◎ 垂直及水平安定翼
◎ 尾旋翼主軸及控制機構
◎ 主旋翼及尾旋翼槳片

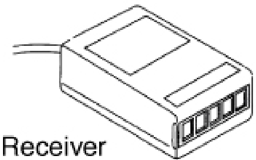
Following these few, simple safety rules will allow you to enjoy the thrill of model helicopter flying for many years to come.
遵從上面幾點簡單的安全規定，將使您能暢快的享受直昇機飛行的樂趣。

OTHER ITEMS REQUIRED　需自行準備的配件

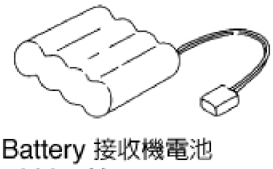
■ RADIO SET / 遙控系統



Transmitter (helicopter type only, 6 or more channels)
發射機（需具備直昇機控制功能的6動以上遙控器）



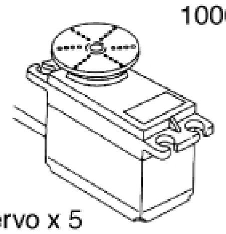
Receiver
接收機



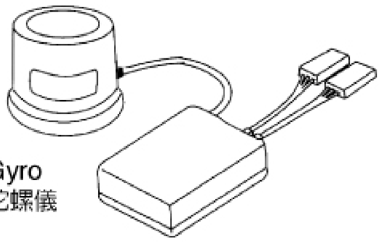
Battery 接收機電池
1000mAh



Switch Harness
具備充電線的開關組

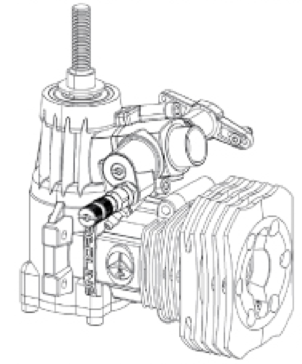


Servo x 5
伺服機x 5個
（部分陀螺儀會指定使用單一規格伺服機）



Gyro
陀螺儀

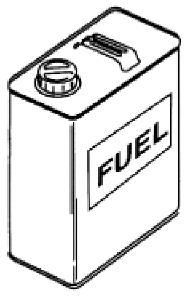
■ ENGINE / 引擎系統



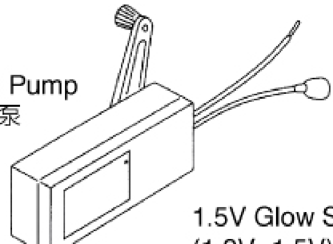
Heli Engine (RL-53H)
直昇機專用引擎（RL-53H）



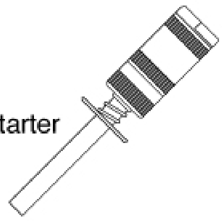
Glow Plug
專用火星塞



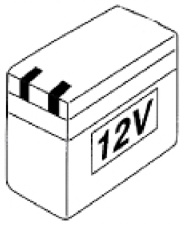
Glow Fuel(15%-30%)
直昇機專用燃油



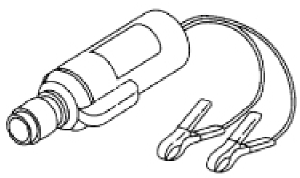
Fuel Pump
加油泵



1.5V Glow Starter
(1.2V~1.5V)
1.5V快速電夾



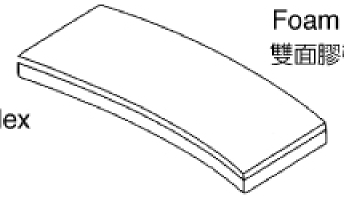
12V Battery
電瓶



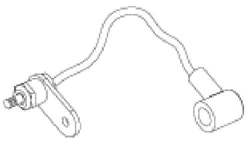
12V Electric Starter
啓動馬達



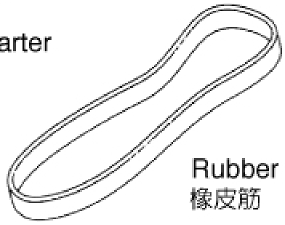
Extended 6mm Hex Starting Tool
啓動棒



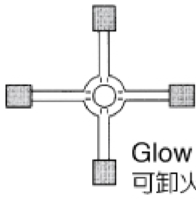
Foam
雙面膠帶



Remote Glow Plug Extension
火星塞外接線
（可視需求自行選擇）

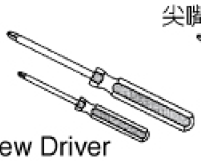


Rubber Band
橡皮筋

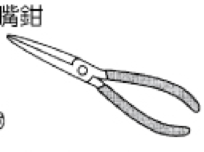


Glow Plug Wrench
可卸火星塞的十字套筒板手

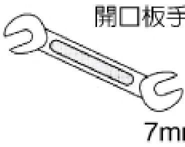
TOOLS REQUIRED FOR ASSEMBLY　需要準備的工具



Screw Driver
各種規格的螺絲起子



Needle Nose Pliers
尖嘴鉗



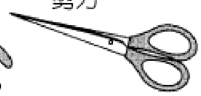
5.5mm Wrench
開口板手
7mm



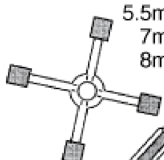
Ball Link Pliers
拆連桿頭的專用鉗子



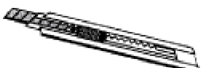
Nipper
斜口鉗



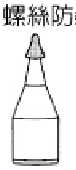
Scissors
剪刀



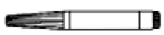
Metric 4-way Wrench
十字套筒板手
5.5mm
7mm
8mm



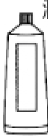
Hobby Knife
美工刀



Instant Glue
螺絲防鬆膠



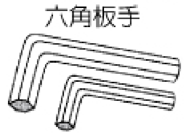
Blue Locktite
瞬間膠



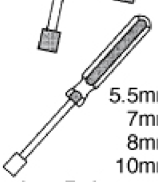
Grease
潤滑油



Epoxy
環氧樹酯

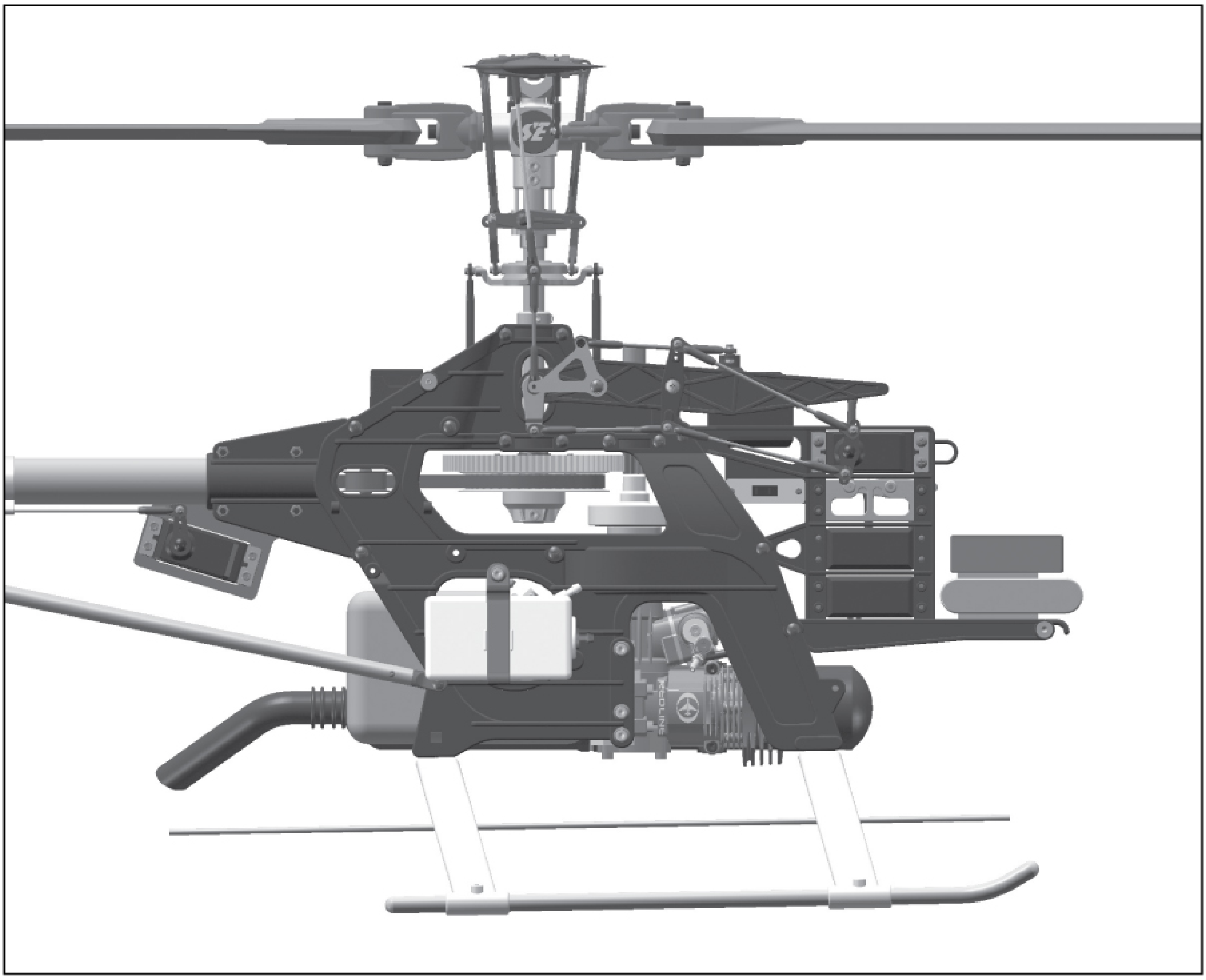


Hex Wrench
六角板手



5.5mm
7mm
8mm
10mm
Socket Drivers
套筒螺絲起子

ASSEMBLING SECTION　組裝程序



Most parts in the Raptor kit are packed according to the assembly steps. The part number and quantity contained in each step are always shown in the square box on each page. Do not open all the bags at once. Open only the bag that is needed for the current assembly step.

每一個零件包都是根據它的組裝步驟歸類包裝，請依照組裝順序開啓零件包，勿將零件包先行全部開啓，如此容易混淆所有的零件以及組裝步驟。

① Fuel Tank Assembly 油箱組裝步驟

Note 1 / 提示1

After assembly, check to make sure the fuel tank clunk can move from top to bottom without touching the back of tank. Also, a fuel filter (available from any hobby shop,1165C/L) should be placed between the fuel tank and the carburetor.

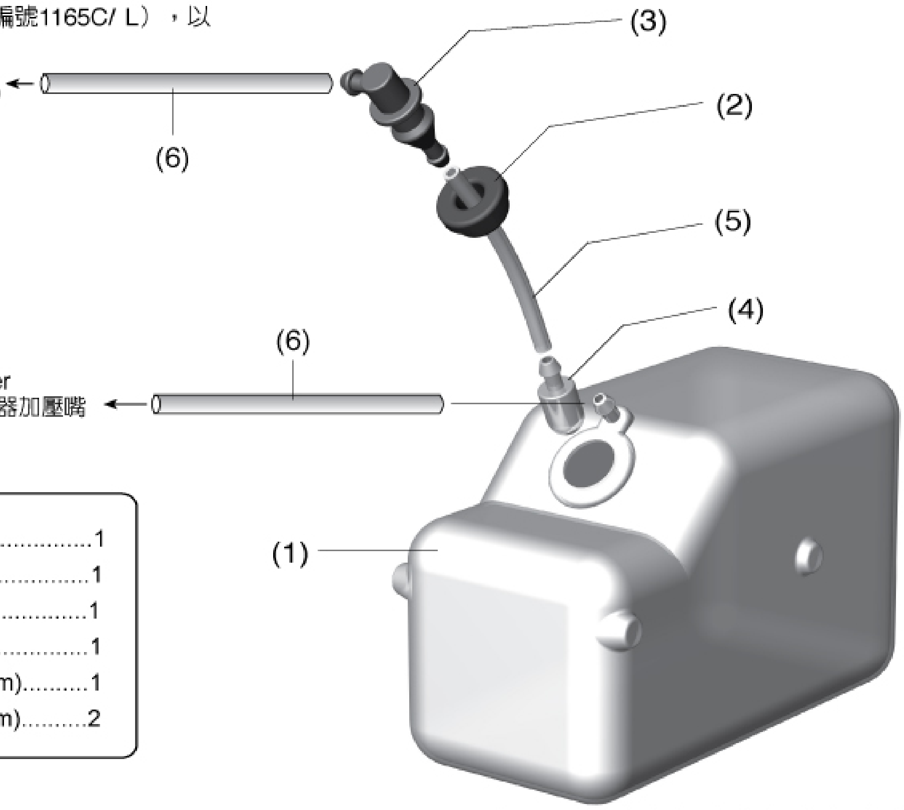
油箱組裝完畢後，必須先確認油箱內油箱重錘能順暢的上下移動，但是也不能因為油管過長而接觸油箱後壁。

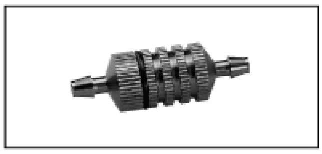
油管需確實安裝，並檢查油箱與油管間有無漏氣現象，建議您在油箱跟引擎之間安裝一個濾油器（例如產品編號1165C/ L），以保持引擎使用燃油的清潔，避免阻塞。

Note 2 / 提示2

It might be necessary to inspect and replace the silicone tube inside the tank every month to ensure the fuel consumption is smooth.

每月詳細檢查油箱內的小油管是否有損傷，以確保供油順暢。





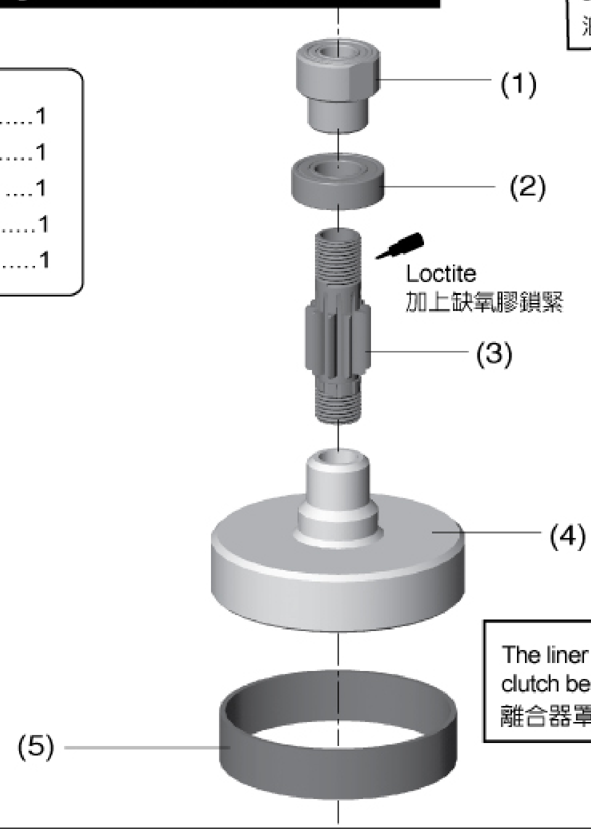
1165C/ L FUEL FILTER 油濾
(Not included 選購)

(1) BK0605 Fuel Tank 油箱.....................................1
(2) BK0062 Fuel Tank Grommet 油嘴栓.................1
(3) BK0463 Fuel Tank Nipple 油嘴.........................1
(4) BE1867 Clunk 油箱重錘....................................1
(5) CB0363-1 Fuel Tube 耐熱油管(ø3.5mm)..........1
(6) BB0362-2 Fuel Tube 耐熱油管(ø5.5mm)..........2

The fuel tank comes assembled already.
油箱已組裝完成

② Clutch Bell Assembly 離合器組裝步驟

(1) BV0868 Pinion Block 驅動齒輪座 1
(2) HMV1680 Bearing 軸承(d8xD16xW5) 1
(3) BK0779 Drive Gear 驅動軸(Pinion 10T) 1
(4) BV1194 Clutch Bell 離合器罩 1
(5) BK0887 Clutch Liner 離合器片.....................1



The liner is already glued in the clutch bell.
離合器罩與離合器片已完成黏合

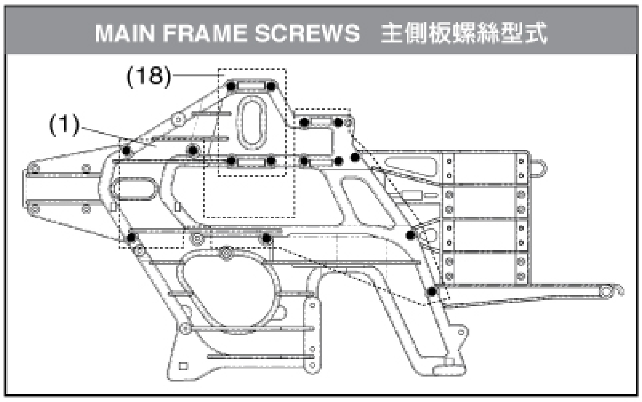
③ Main Frame Assembly-Part1　主側板組裝步驟-1

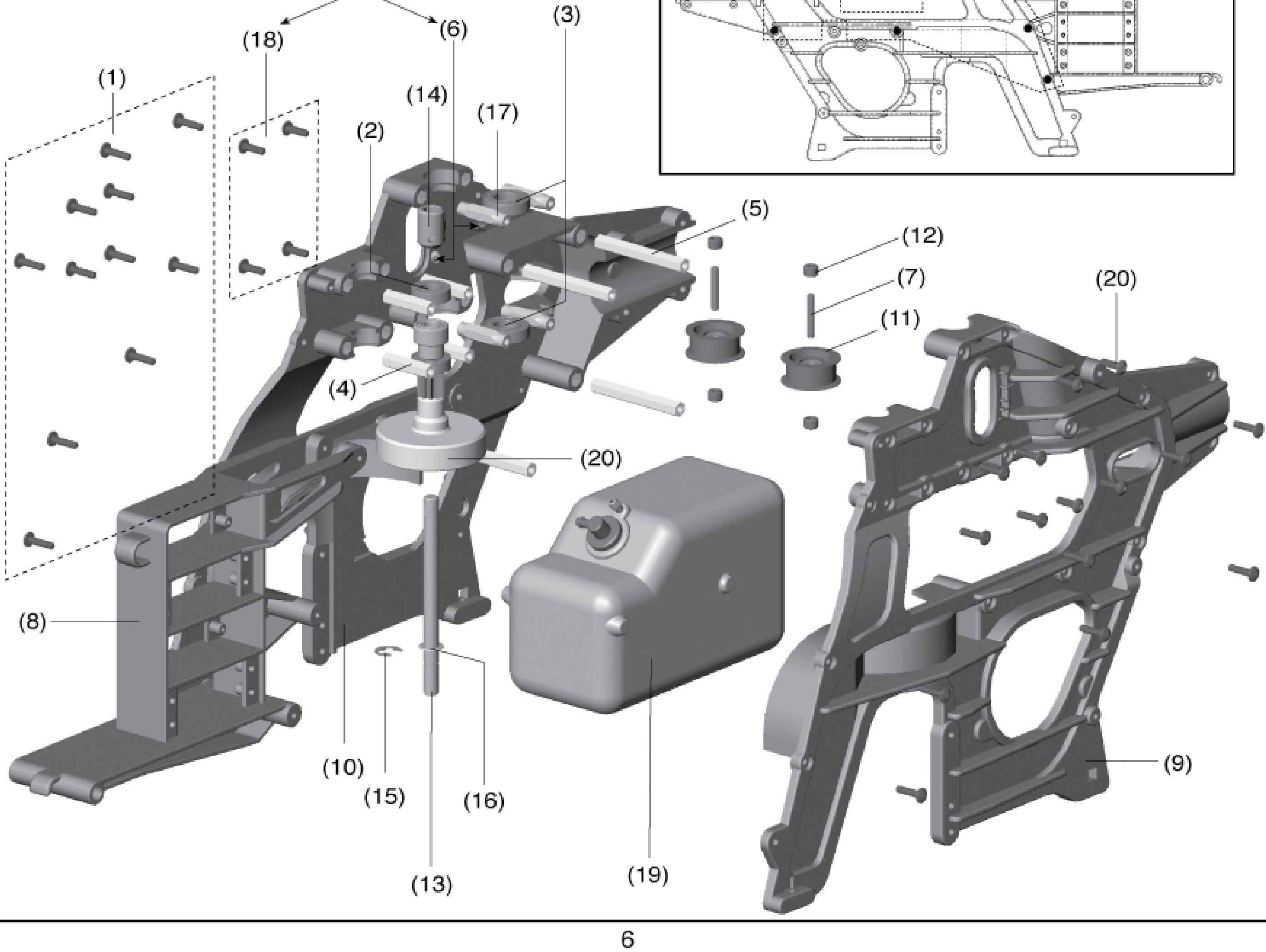
Please insert the frame spacers, bearings, pulley and parts in the frames according to the drawing below. Install four metal aluminum frame spacers beside the main shaft bearings. Remember to add Loctite when securing these four spacers. Tighten the screws snugly, but do not over torque them which could strip the plastic.

Insert starter shaft through the center of the clutch bell assembly, through the top starter shaft bearing and into the starter coupling. Secure it with the two set screws. Make sure this is tightly secured.The main frame can be reinforced with the recommended Aluminum Frame Post (PV0104).

組裝側板時，所使用的自攻牙螺絲必須確實鎖緊，但是也不能因此發生過度鎖緊而導致滑牙或斷裂現象。
啓動軸組裝時，需與啓動接頭確實鎖緊。
為加強側板強度，我們建議將膠側板支柱更換為金屬側板支柱（PV0104）

(1) HSE3-12B Self Tapping Screw 扁圓型自攻螺絲(M3x12)..... 22
(2) HMV696ZZY Bearing 軸承(d6xD15xW5).............................. 1
(3) HMV6800ZZY Bearing 軸承(d10xD19xW5)...........................2
(4) BK0059 Frame Spacer 側板支柱(S)..................................... 4
(5) BK0058 Frame Spacer 側板支柱(L)..................................... 4
(6) HME4-5B Set Screw 無頭內六角螺絲(M4x5)........................ 2
(7) BK0081 Pin 固定銷... 2
(8) BK0057 Servo Frame 伺服機座... 1
(9) BK0599 Main Frame Left Side 左側板.................................. 1
(10) BK0600 Main Frame Right Side 右側板...............................1
(11) BV0894 Metal Guide Pulley 金屬主惰輪組.......................... 2
(12) BK0036 Pulley Collar 惰輪襯套.. 4
(13) BK0592 Starter Shaft 啓動軸.. 1
(14) BK0594 Starter Coupling 啓動接頭......................................1
(15) HMS5 E-Clip E型扣環5m/m.. 1
(16) BK0584 Thrust Washer 止推墊片...1
(17) CK0136 Metal Frame Spacer(S) 金屬支柱.......................... 4
(18) HSA3-10 Button Head Socket Screw 半圓頭內六角螺絲(M3x10).. 8
(19) Fuel Tank Assembly 油箱組
(20) Clutch Bell Assembly 離合器罩組





④ Main Drive Gear Assembly 主齒輪組裝步驟

It is necessary to add grease inside the one way clutch before your first flight. The clutch might lock up once grease is gone. Oneway grease(PV0517) or ball differential grease is recommended for this lubrication.

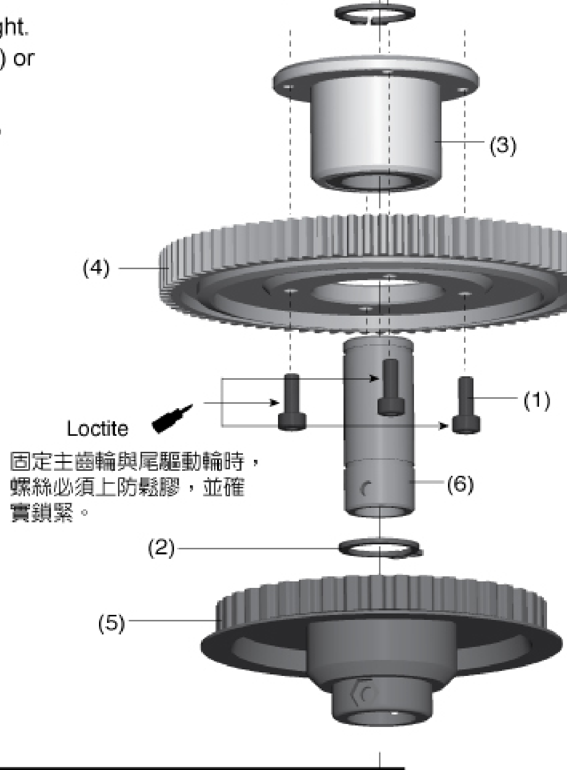
單向離合器軸組裝入單向離合器組前，請先在單向離合器內抹上些許潤滑油，
以防止單向組咬死，並增長單向離合器壽命。
建議使用廠所提供之單向專用潤滑油（PV0517）

(1) HMC3-8B Socket Screw 內六角螺絲(M3x8)	4
(2) HMQ14 Snap Ring 軸用C型扣環	2
(3) BV0033 One Way Clutch Housing 單向離合組	1
(4) BK0148 Main Spur Gear 85T 主齒輪	1
(5) BK1196 Autorotation Tail Drive Pulley 尾驅動輪(熄火降落組)	1
(6) BK1198 One Way Clutch Shaft 單向離合器軸	1



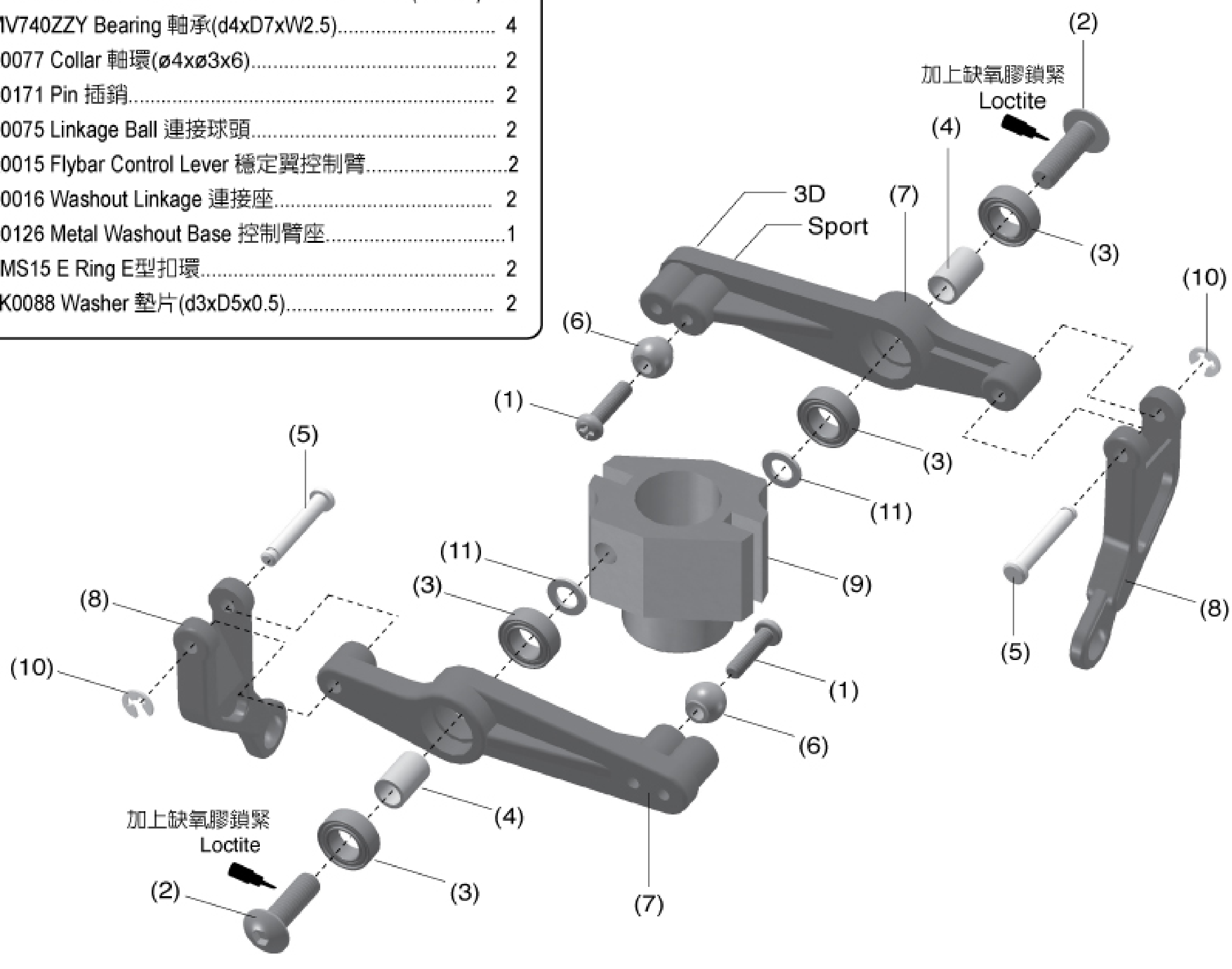
PV0517 ONEWAY GREASE
(Not included)

BK1196 尾驅動輪(熄火降落組)組裝時請先在內側抹上塑膠專用潤滑油(PV0517)、以防因磨擦發生異常變形或熔蝕現象。



⑤ Washout Assembly 控制臂（下剪型臂）組組裝步驟

(1) HMJ2-10N Self Tapping Screw 圓頭自攻螺絲(M2x10)	2
(2) HSA3-10 Button Head Socket Screw 內六角螺絲(M3x10)	2
(3) HMV740ZZY Bearing 軸承(d4xD7xW2.5)	4
(4) BK0077 Collar 軸環(ø4xø3x6)	2
(5) BK0171 Pin 插銷	2
(6) BK0075 Linkage Ball 連接球頭	2
(7) BK0015 Flybar Control Lever 穩定翼控制臂	2
(8) BK0016 Washout Linkage 連接座	2
(9) BK0126 Metal Washout Base 控制臂座	1
(10) HMS15 E Ring E型扣環	2
(11) BK0088 Washer 墊片(d3xD5x0.5)	2

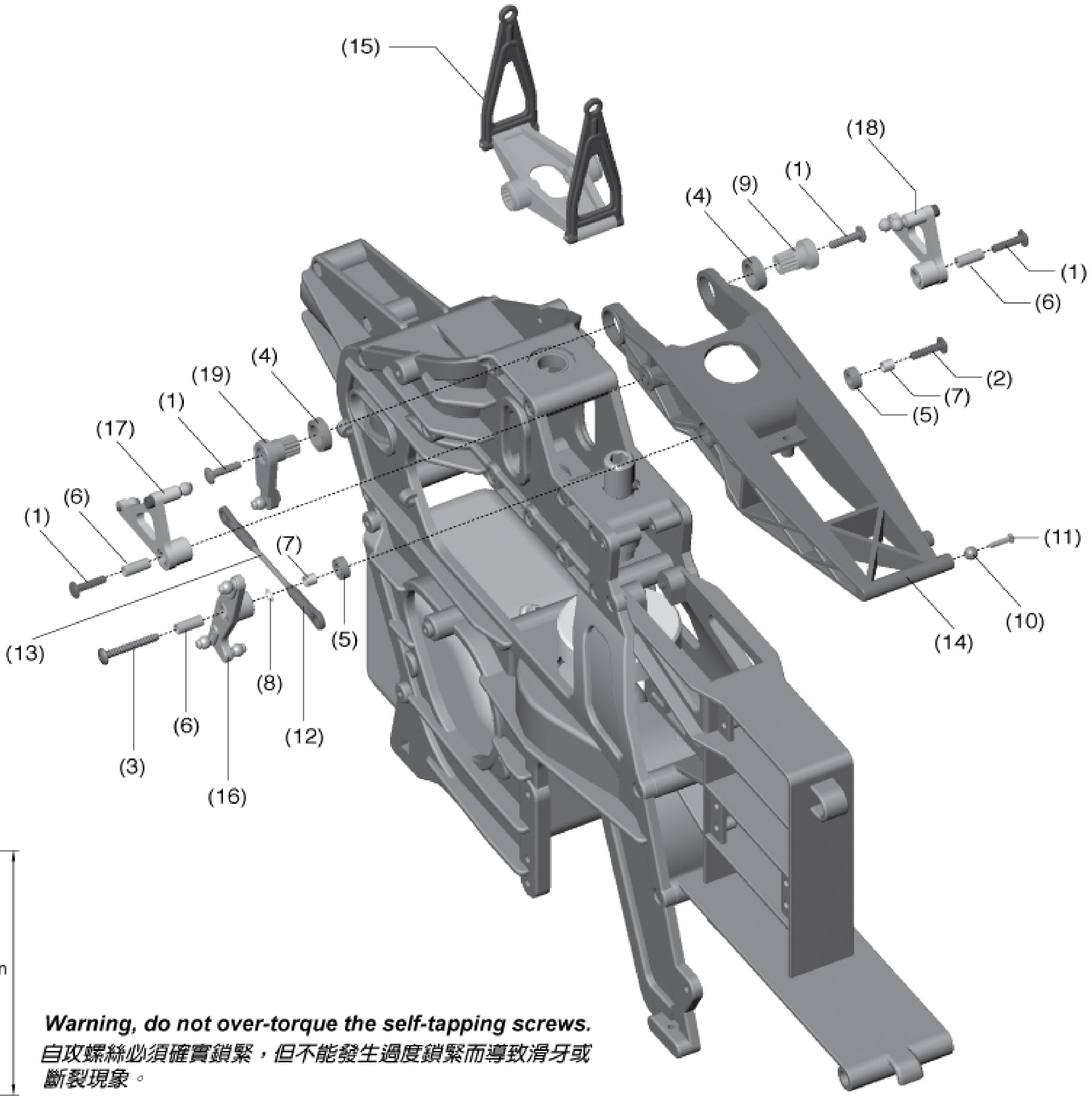


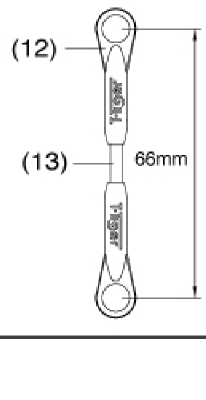
⑥ Main Frame Assembly-Part2　主側板組裝步驟-2

Please complete subassemblies 6-1 through 6-4, then add them to the main frame.
Insert the elevator control arm subassembly 6-1 in between upper bearing frame first. Then fit the plastic pitch control frame subassembly. Next insert elevator arm control shaft and elevator parallel lever subassembly. Then secure the collective pitch control arm using self tapping screw (M3x12) and self tapping screw(M3x22). Adjust the two self tapping screws so the pitch control arm can rock freely without excessive play. Attach the linkage rod to the parallel elevator linkage balls. Finally add two metal aileron levers and the collective pitch control arm.

組裝攻角控制臂、側轉控制臂和升降舵雙推拉搖臂於側板時，請先完成6-1到6-4步驟。首先完成6-1步驟升降舵控制組，穿入側板並注意其方向性。放上攻角控制臂，壓入軸承、升降固定軸及控制桿(6-4)，鎖上螺絲固定，注意不可過度鎖緊。再取2個側轉控制臂(6-3)鎖上側板，注意方向性及上下運行無阻礙。取升降舵雙推拉搖臂(6-2)鎖上螺絲固定。壓上連接桿最後檢查個部螺絲鎖的位置及方向性。

(1) HSE3-18B Self Tapping Screw 扁圓型自攻螺絲(M3x18).........4
(2) HSE3-12B Self Tapping Screw 扁圓型自攻螺絲(M3x12).........1
(3) HMJ3-22B Self Tapping Screw 自攻螺絲(M3x22)....................1
(4) HMV1280ZZY Bearing 軸承(d8xD12xW3.5)............................2
(5) HMV840ZZY Bearing 軸承(d4xD8xW3)..................................2
(6) BK0076 Collar 軸環(d3xD4x10)...3
(7) BK0078 Collar 軸環(d3xD4x4)..2
(8) BK0088 Washer 墊片(d3xD5x0.5)..1
(9) BK0020 Elevator Arm Control Shaft 升降舵固定軸..................1
(10) BK0075 Linkage Ball 連接球頭..1
(11) HMJ2-10N Self Tapping Screw 自攻螺絲(M2x10)..................1
(12) BK0086 Ball Link 單頭連接桿..2
(13) BK0840 SUS Linkage Rod 連接桿...1
(14) BK0017 Collective Pitch Control Arm 攻角控制臂....................1
(15) 6-1 Elevator Control Arm Subassembly 升降舵控制臂組裝步驟.........1
(16) 6-2 Elevator Push Pull Lever Subassembly 升降舵雙推拉搖臂組裝步驟....1
(17) 6-3 Metal Aileron Lever Subassembly (R) 側轉控制搖臂(右)...........1
(18) 6-3 Metal Aileron Lever Subassembly (L) 側轉控制搖臂(左)...........1
(19) 6-4 Elevator Parallel Lever Subassembly 升降舵控制組...................1

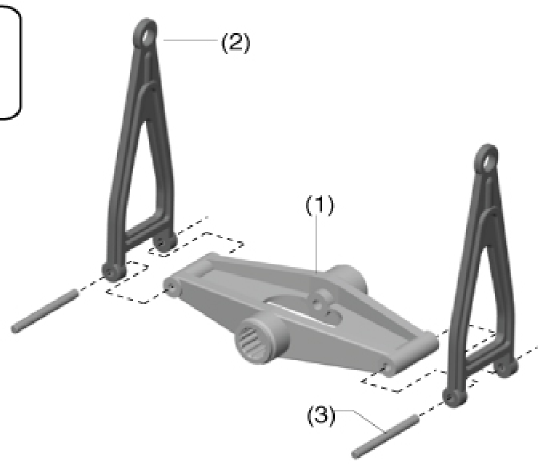




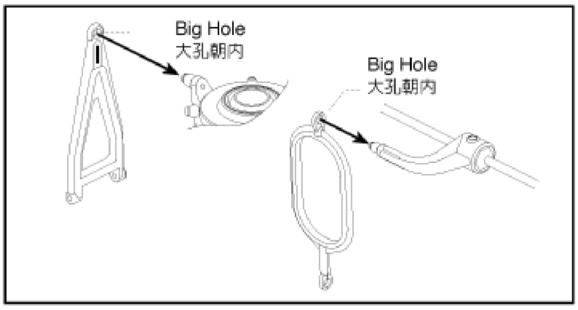
Warning, do not over-torque the self-tapping screws.
自攻螺絲必須確實鎖緊，但不能發生過度鎖緊而導致滑牙或斷裂現象。

6-1 Elevator Control Arm Subassembly 升降舵控臂組裝步驟

(1)BK0018 Elevator Control Arm 升降舵控制臂.............................1
(2)BK0023 Elevator Control Arm Link 升降舵連接座.....................2
(3)BK0084 Pin 固定銷...2

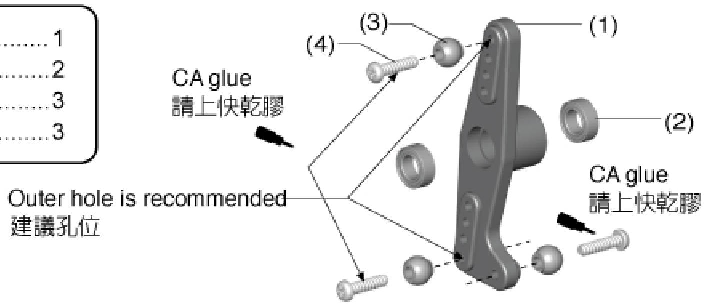


INSTALLATION OF THE RODS 安裝注意事項



6-2 Elevator Push Pull Lever Subassembly 升降舵雙推拉搖臂組裝步驟

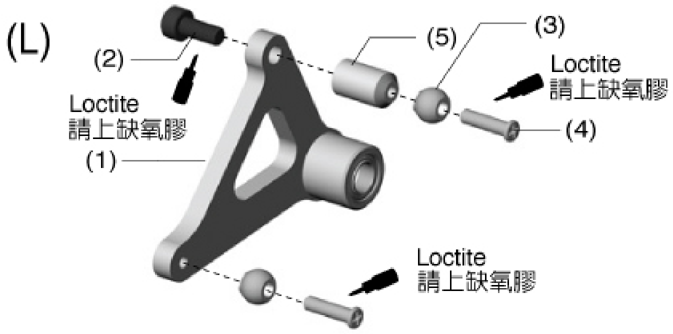
(1)BK0836 Elevator Push Pull Lever 升降舵雙推拉搖臂............1
(2)HMV740ZZY Bearing (d4xD7x2.5) 滾珠軸承..........................2
(3)BK0075 Linkage Ball 連接頭..3
(4)HMJ2-8N Self-Tapping Screw 自攻螺絲(細)(M2x8)................3

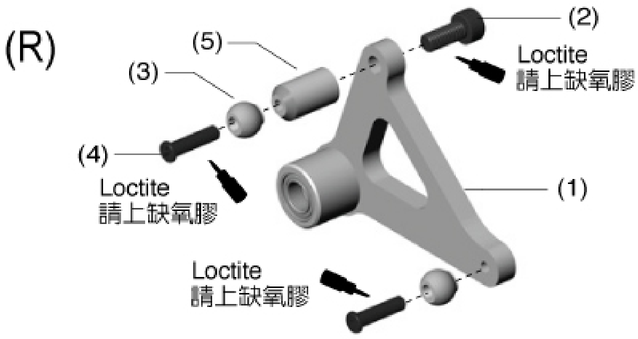


6-3 Metal Aileron Lever Subassembly 金屬副翼控制臂組裝步驟

(1)BV0898 Metal Aileron Llever 金屬副翼控制搖臂組(左).......1
(2)HMC25-6B Socket Screw 內之角螺絲(M2.5x6)..................1
(3)BK0075 Linkage Ball 連接頭... 2
(4)HMF2-8N Phillips Machine Screw 圓頭十字螺絲(M2x8)..... 2
(5)BK0900 Aileron Lever Post 金屬副翼控制支柱...................1

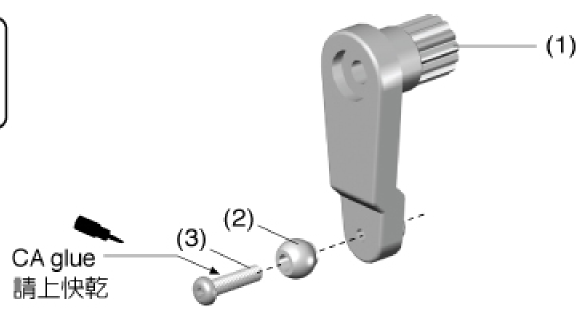
(1)BV0899 Metal Aileron Llever 金屬副翼控制搖臂組(右)........1
(2)HMC25-6B Socket Screw 內之角螺絲(M2.5x6)...................1
(3)BK0075 Linkage Ball連接頭.. 2
(4)HMF2-8N Phillips Machine Screw 圓頭十字螺絲(M2x8)......2
(5)BK0900 Aileron Lever Post 金屬副翼控制支柱....................1





6-4 Elevator Parallel Lever Subassembly 升降舵控制組裝步驟

(1)BK0019 Elevator Arm Parallel Lever 升降舵控制桿............... 1
(2)BK0075 Linkage Ball 連接頭..1
(3)HMJ2-10N Self-Tapping Screw 自攻螺絲(細) (M2x10)...........1

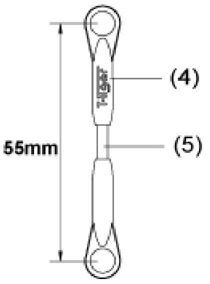


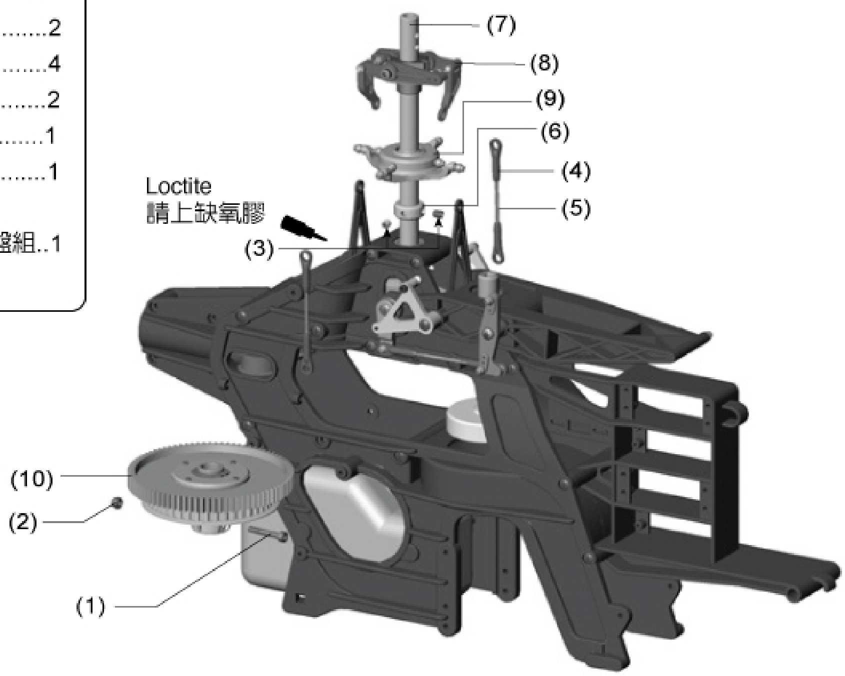
⑦ Main Frame Assembly-Part3 主側板組裝步驟-3

Insert main shaft through the shaft bearings and ensure that the end with one hole is pointed down. Next, slide main gear assembly into position on the shaft and line up the holes in the main shaft with the holes in one way clutch shaft of the main gear assembly. Insert the socket screw and secure it with the lock nut. Secure the main gear assembly just tight, do not overtorque the socket screw as it might damage the plastic autorotation gear. Next, slide the mainshaft lock ring onto the main shaft. Secure it with the set screws and ensure there is no clearance between the ring and bearing. Then slide on the swashplate assembly and attach the elevator and aileron control linkages to the outside swashplate linkage balls. Next, slide on washout assembly and attach washout linkage to the inner linkage balls of the swashplate.

主軸穿過機身兩個主軸軸承後，固定主軸時先從主齒輪部分固定、鎖緊，然後將主軸往上提至無虛位後穿上主軸止檔圈，上無頭內六角螺絲固定（需抹螺絲防鬆膠）。然後再穿入十字盤，將升降舵連接座裝上，再穿入控制臂組。

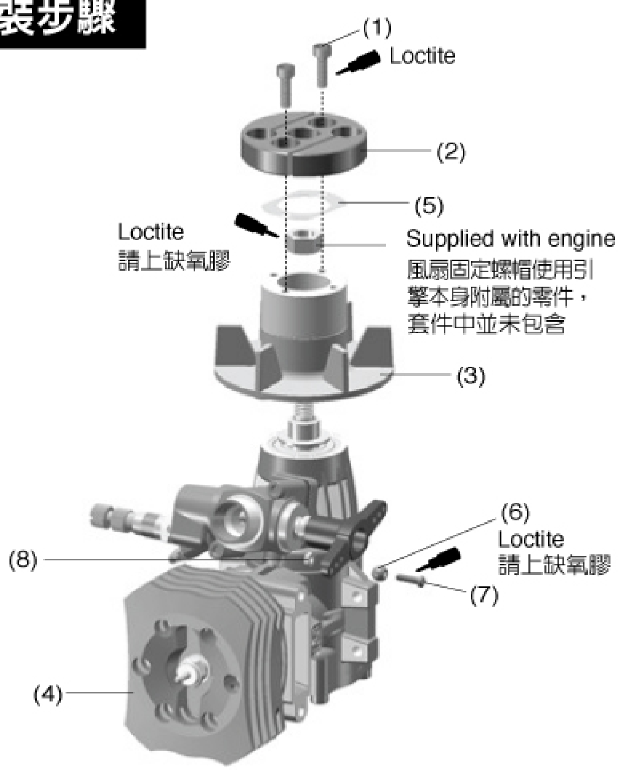
(1) BK1197 Main Shaft Bolt 內六角螺絲....................1
(2) HMM3Z Lock Nut (M3) 止鬆螺帽..........................1
(3) HME4-5B Set Screw 無頭內六角螺絲(M4x5).......2
(4) BK0086 Ball Link 單頭連接桿...............................4
(5) BK0839 SUS Linkage Rod 連接桿......................2
(6) BK0030 Main Shaft Lock Ring 止檔圈.................1
(7) BK1195 Harden Main Shaft 強化主軸..................1
(8) Wash Out Assembly 控制臂組
(9) BV0092 Metal Swash Plate Assembly 十字盤組..1
(10) Main Gear Assembly 主齒輪組





⑧ Engine Assembly 引擎動力組組裝步驟

(1) HMC3-10B Socket Screw 內六角螺絲(M3x10)..........2
(2) BV0589 Clutch Shoe 離合器組..................................1
(3) BV0143 Cooling Fan 冷卻風扇組.............................. 1
(4) No.9609 RL-53H Heli Engine 直昇機專用引擎..........1
(5) BK0170 Shim 離合器墊片..1
(6) BK0075 Link Ball 連接頭...1
(7) HMF2-8N Screw 圓頭十字螺絲(M2x8).......................1
(8) HML2 Hex Nut 六角螺帽(M2) 1

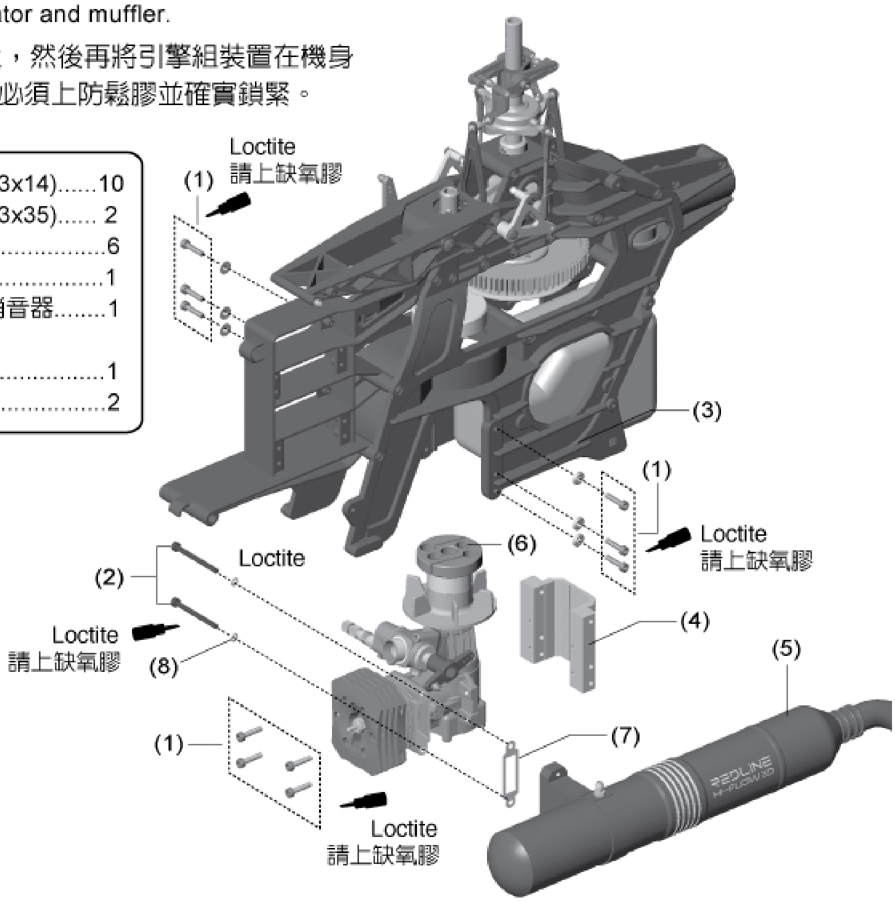


⑨ Main Frame Assembly-Part4 主側板組裝步驟-4

Add Loctite to all metal to metal screw surfaces. After installing the engine, connect the silicone fuel tube to the carburator and muffler.

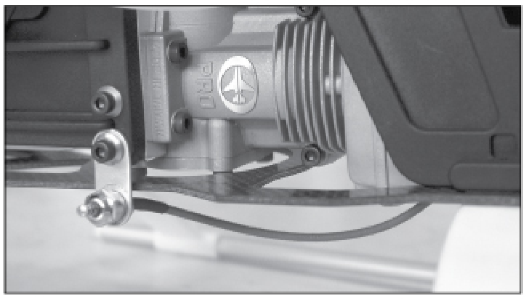
組裝的順序是將引擎組先裝置在引擎座上，然後再將引擎組裝置在機身上，消音器是最後組裝的，所有的螺絲都必須上防鬆膠並確實鎖緊。

(1) HMC3-14B Socket Screw 內六角螺絲(M3x14)......10
(2) HMC3-35B Socket Screw 內六角螺絲(M3x35)...... 2
(3) BK0087 Flat Washer 墊圈.......................................6
(4) BK0144 Engine Mount 引擎固定座.........................1
(5) BA1738 RL Hi-flow 3D Pipe 高流量3D 消音器........1
(6) Engine Assembly 引擎動力組
(7) BA1579 Muffler Gasket 消音器墊片........................1
(8) HMT3B Spring Washer 彈簧墊片............................2

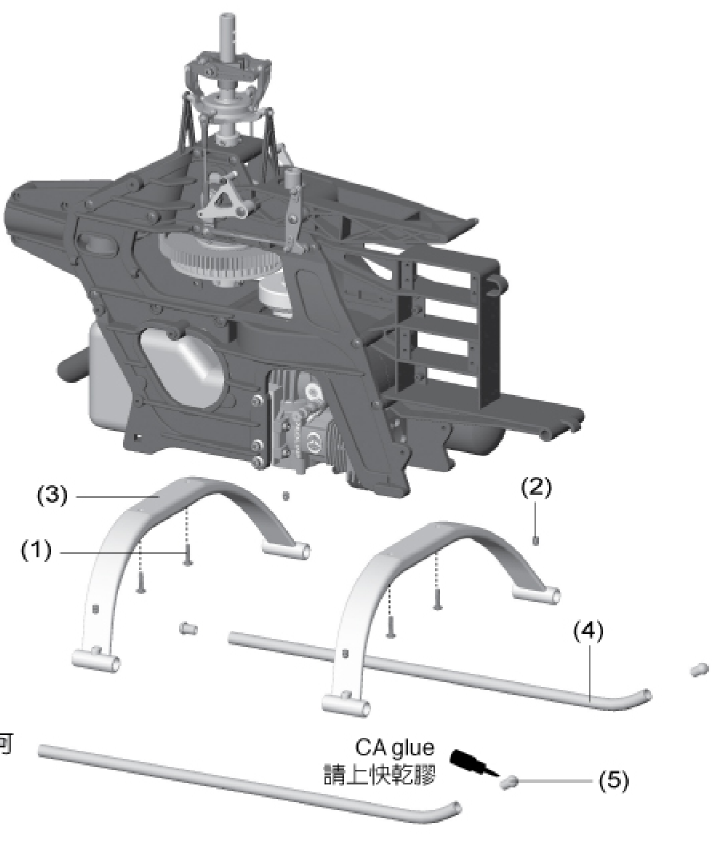


⑩ Landing Skid Assembly 腳架組裝步驟

(1) HSE3-18B Self Tapping Screw 扁圓型自攻螺絲(M3x18)...4
(2) HME4-5B Set Screw 無頭內六角螺絲(M4x5).....................4
(3) BK0066 Skid Brace 支撐架..2
(4) BK0064T Skid Pipe 底座圓管..2
(5) BK0065 Skid Pipe End Cap 圓管塞..................................4



The optional Thunder Tiger Remote Glow Plug Adaptor (#3803) is recommended as shown, making starting easier without the removal of your canopy.
推薦您可選購雷虎科技所出品之編號(3803)火星塞延長線.將可更方便進行啓動引擎。



⑪ Main Rotor Head Assembly 主旋翼頭的組裝步驟

Secure the linkage ball on the main rotor pitch housing first, then insert the dampers in the main rotor hub. Add silicon oil or vaseline to insert the feathering shaft through the dampers.

Apply Loctite on the M4x8 socket screw then secure the main rotor pitch housing on the feathering shaft as shown.

組裝主旋翼轉座需注意方向性，推軸承須上潤滑油。在裝入轉座時需注意固定軸兩邊等長。鎖上固定螺絲時請上缺氧膠。

(1)BK0007 Flybar Control Rod 穩定翼操控環..........................2	(8)BK0581 Flap Collar 避震軸環..2
(2)BK0435 Washer 墊圈(d4xD11xW1.7)................................2	(9)BV0793 Metal Main Rotor Hub 金屬主旋翼固定座.............1
(3)HMV1360ZZY Bearing 滾珠軸承(d6xD13xW5)..................4	(10)HMC4-8B Socket Screw 內六角螺絲(M4x8).....................2
(4)BK0584 Thrust Washer 止推墊片.......................................2	(11)BK0075 Linkage Ball 連接頭..2
(5)HMX0612 Thrust Bearing 止推軸承....................................2	(12)HMJ2-10N Self Tapping Screw 自攻螺絲(細) (M2x10)......2
(6)BK0596 Main Rotor Pitch Housing 主旋翼轉座..................2	(13)BK0795 Innere Damper 內避震墊圈.................................2
(7)BK0583 Feathering Shaft 固定軸..1	(14)BK0796 Outer Damper 外避震墊圈..................................2

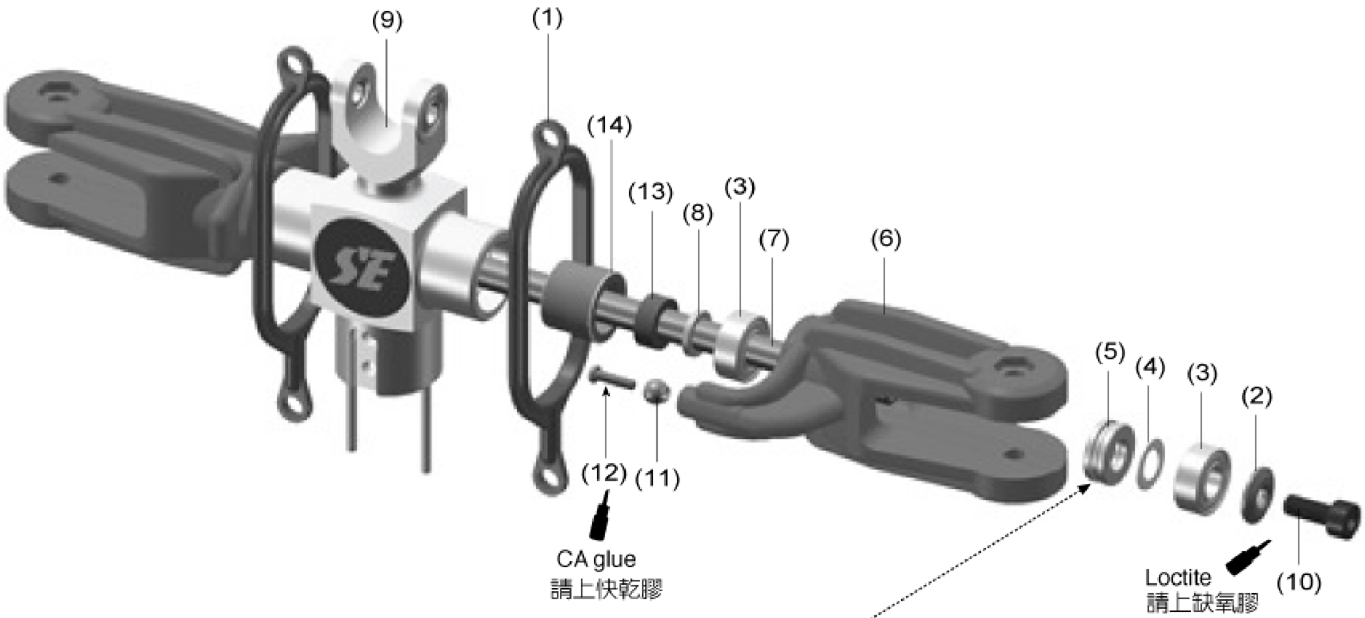
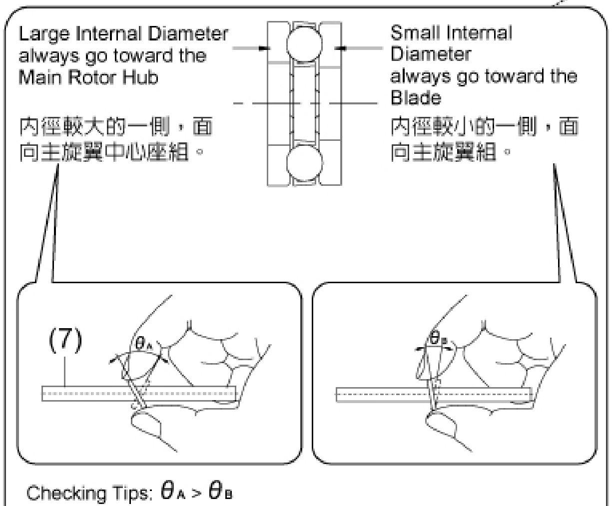


Diagram for Thrust Bearing Assembly

推軸承組裝注意事項



Checking Tips: $\theta_A > \theta_B$

小技巧

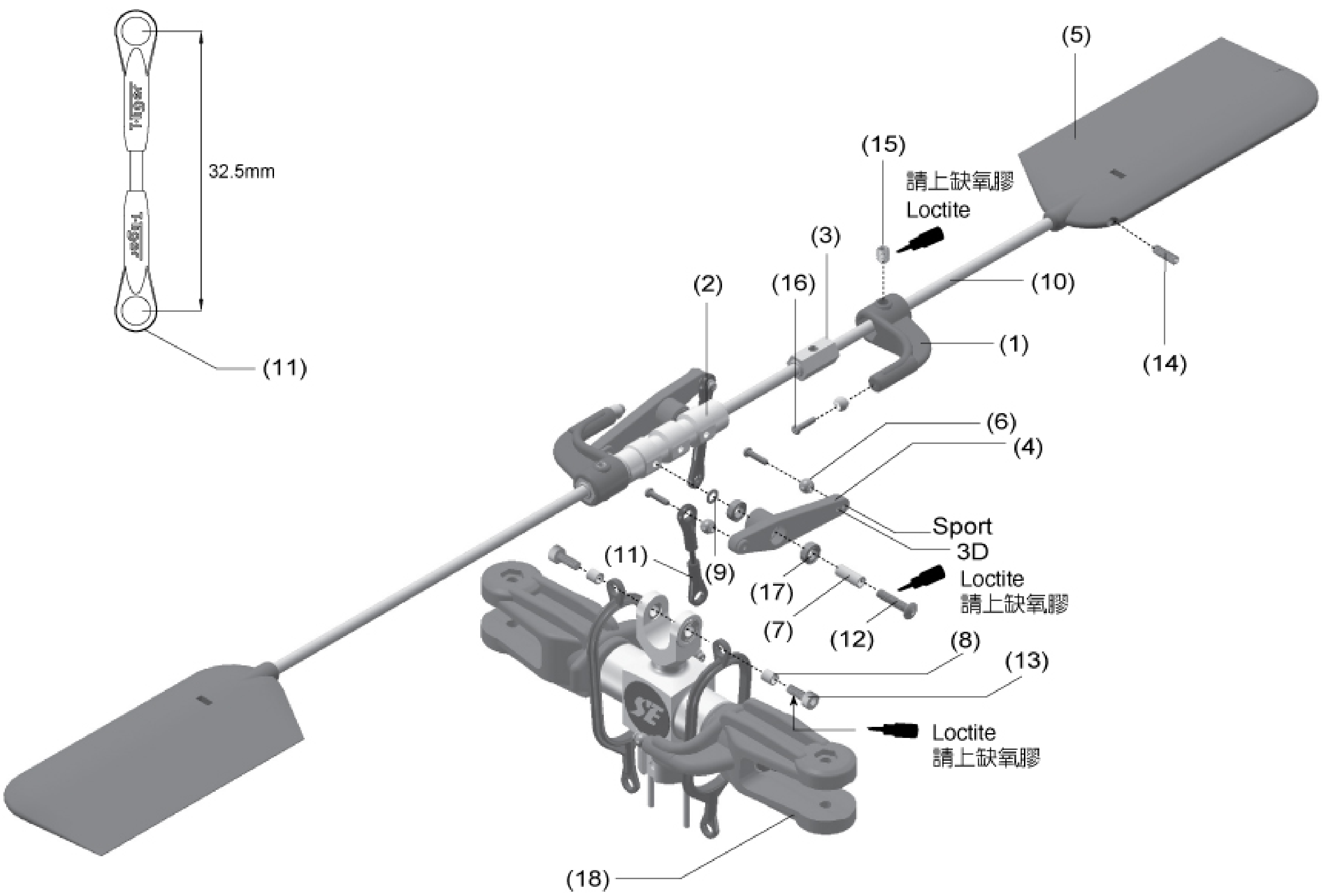
⑫ Flybar Assembly 穩定翼組裝步驟

Begin by attaching six linkage balls to the flybar control arm and mixing lever with self tapping screws. Slide the flybar into seesaw hub. Slide flybar arm bushing and flybar control arm onto the flybar rod. Ensure the flybar has extends equally from each side of the seesaw hub, then tighten the HME4-5B set screws. Add the paddles. Ensure the two paddles and the two flybar control arms are all parallel. Lock the paddles with HME3-10B set screws.
Assemble and install the mixing levers as shown. Be careful not to let the loctite seep into the bearings.
Attach the flybar control rod to the flybar control arm and use the double link to connect the mixing lever (short side) to the main rotor pitch housing.

開始組裝6個連接球頭鎖螺絲，並確實鎖緊，不可與機件有空隙。穩定翼轉臂與混控臂鎖上對手件時，請注意軸襯及墊片安裝。鎖穩定翼轉臂的HME 4-5B無頭內六角螺絲需平穩對準平衡削平位置。混控臂鎖上固定軸時需缺氧膠，鎖上後檢查順暢度不可有間隙。穩定翼片轉入穩定至固定置鎖上HME3-10B無頭內六角螺絲需平穩鎖入，確實鎖到固定位置，檢查角度鎖緊。完成穩定翼組後裝入主旋翼固定座上方，注意方向性。拉桿安裝後檢查順暢度。

請依下圖說明組裝混控臂；請注意勿使缺氧膠滲入軸承中。
將穩定翼控制臂裝上穩定翼操控環；以連接頭連接混控臂（短邊）及主旋翼攻角座。

- (1)BK0002 Flybar Control Arm 穩定翼轉臂 2
- (2)BK0892 3D Seesaw Hub 3D版穩定桿固定軸 1
- (3)BK0005 Flybar Arm Bushing 轉臂六角襯套 2
- (4)BK0893 Mixing Lever 控制搖臂 2
- (5)BK0067R Flybar Paddle 穩定翼(紅) 2
- (6)BK0075 Linkage Ball 連接頭 6
- (7)BK0076 Collar 軸環(d3xD4x10) 2
- (8)BK0078 Collar 軸環(d3xD4x4) 2
- (9)BK0088 Washer 墊片(d3xD5x0.5) 2
- (10)BK0631 SUS Flybar 平衡桿 1
- (11)BV0085 Double Link 雙頭連接桿 2
- (12)HSA3-14 Button Head Socket Screw 半圓頭內六角螺絲(M3x14)..2
- (13)HMC3-8B Socket Screw (M3x8) 內六角螺絲 2
- (14)HME3-10B Set Screw 無頭內六角螺絲(M3x10) 2
- (15)HME4-5B Set Screw 無頭內六角螺絲(M4x5) 2
- (16)HMJ2-10N Self Tapping Screw 自攻螺絲(M2x10) 6
- (17)HMV740ZZY Bearing 滾珠軸承(d4xD7x2.5) 4
- (18)Main Rotor Head Assembly 主旋翼頭組裝步驟 1

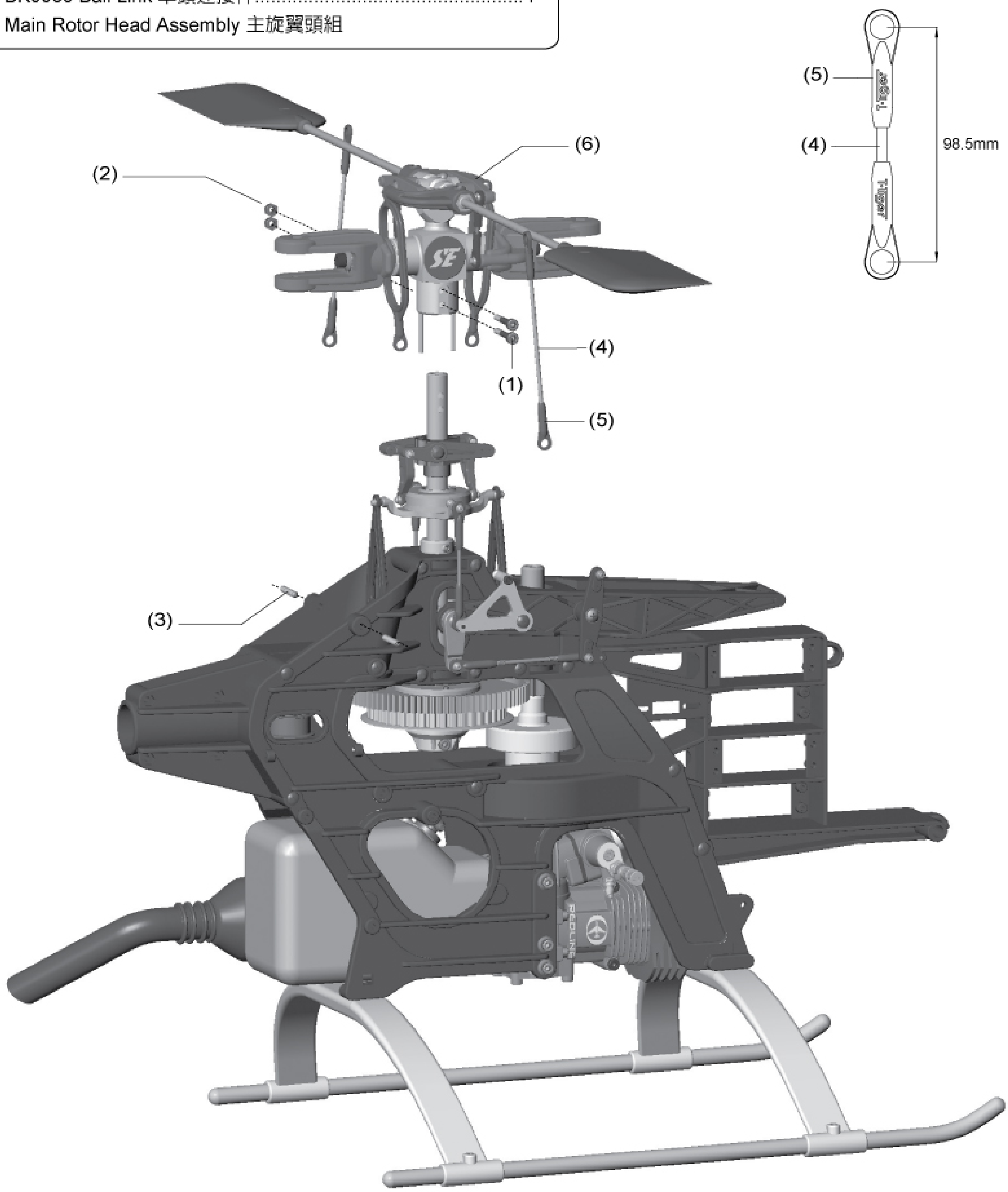


⑬ Main Frame Assembly-Part5 主側板組裝步驟-5

Slide the main rotor assembly over the main shaft and align the two pins to slide in the washout assembly. Ensure the holes in the main shaft line up with the holes in the main rotor head. Insert the socket screw and secure with locknut. Attach the ball linkage rods to the long end of the mixing lever and to the remaining inside linkage balls of the swashplate.

整個主機身最後的組裝步驟由機身固定支柱開始，先將機身固定支柱螺絲鎖進機身側板中，保留約8㎜的長度上螺絲防鬆膠，再將機身固定支柱鎖緊。
將旋翼頭穿入主軸中，必須確實確認旋翼頭固定螺絲孔與主軸固定孔成平行，再將固定螺絲確實鎖緊。
裝置連接桿時，儘可能確保單頭連接桿的方向性。

(1) BK0616 Socket Screw 內六角螺絲(半牙)(M3x20)................. 2
(2) HMM3Z Lock Nut 止鬆螺帽(M3)...2
(3) HME3-18.5B Set Screw 無頭內六角螺絲(M3x18.5)................2
(4) BK0842 SUS Linkage Rod SUS連接桿...................................2
(5) BK0086 Ball Link 單頭連接桿..4
(6) Main Rotor Head Assembly 主旋翼頭組



⑭ Tail Unit Assembly 尾旋翼系統組裝步驟

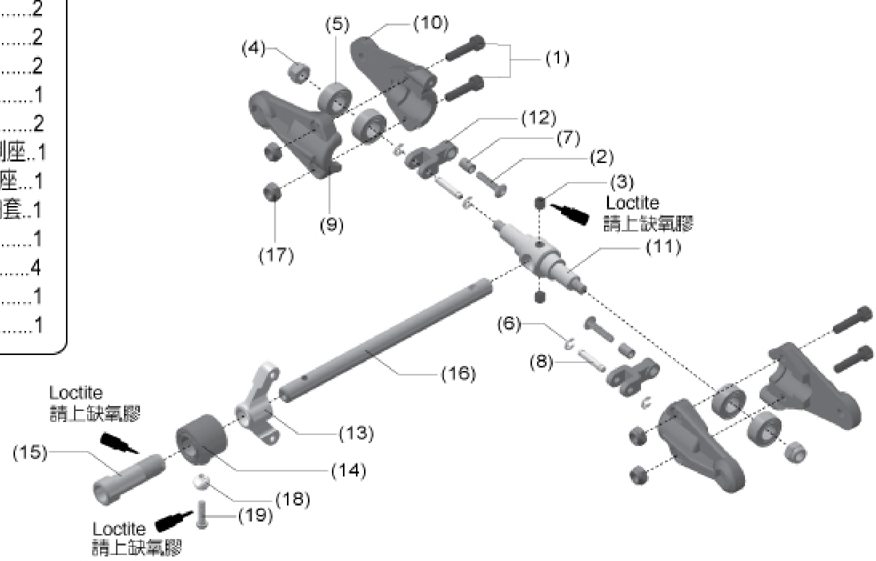
Secure the tail rotor hub(#11) on tail rotor shaft first, note the set screw(#3) should be right setting on the dot of the shaft. Do not forget to apply Loctite on the set screws.
Next work on the housing assembly, use care to install the tail pitch control link, do not over tighten the selftapping screw(#2). Make sure it is just tight and the link rotates freely.
Assemble the tail pitch slider and fork. Be careful when securing the fork on the slider bushing, do not damage the bushing or it will not move smoothly on the tail rotor shaft.

組裝程序由左至右順序組裝：
1.尾輪固定銷之固定螺絲必須確實上防鬆膠固定。
2.尾旋翼固定座之固定螺絲必須確實對準尾軸之定位點，確實上防鬆膠鎖緊。
3.尾旋翼控制軸套與尾旋翼控制座，鎖緊時必須確認不能有偏擺的情形發生，鎖緊後視實際情形鬆退至軸承滑順滾動。

(1)HMC2510B Socket Screw內六角螺絲(M2.5x10)..................4
(2)HSE2-10B Selftapping Screw 扁圓型自攻螺絲(M2x10).......2
(3)HME3-3B Set Screw 無頭內六角螺絲(M3x3).......................2
(4)HMM3Z Lock Nut 止鬆螺帽(M3)..2
(5)HMV1050ZZO Angular Bearing 斜角滾珠軸承(d5xD10x4)....4
(6)HMS15 E Ring E型扣環..4
(7)BK0082 Collar 軸環(d2xD3xW4.3).....................................2
(8)BK0546 Pin 固定銷(2mm)..2
(9)BK0302-1 Tail Pitch Housing 尾旋翼座(A)..........................2
(10)BK0303-1 Tail Pitch Housing 尾旋翼座(B)........................2
(11)BK0821 SUS Tail Rotor Hub SUS 尾旋翼固定座.............1
(12)BK0026 Tail Pitch Control Link 尾旋翼連接頭..................2
(13)BK0545 Metal Tail Pitch Control Fork 金屬尾旋翼控制座..1
(14)BK0806 Metal Tail Pitch Control Slider 金屬尾旋翼滑座...1
(15)BK0028 Tail Pitch Control Slide Bushing 尾旋翼控制軸套..1
(16)BK0053 Tail Rotor Shaft 尾旋翼軸....................................1
(17)HMM25Z Lock Nut 止鬆螺帽(M2.5)..................................4
(18)BK0075 Link Ball 連接頭..1
(19)HMF2-8N Screw 圓頭十字螺絲(M2x8).............................1



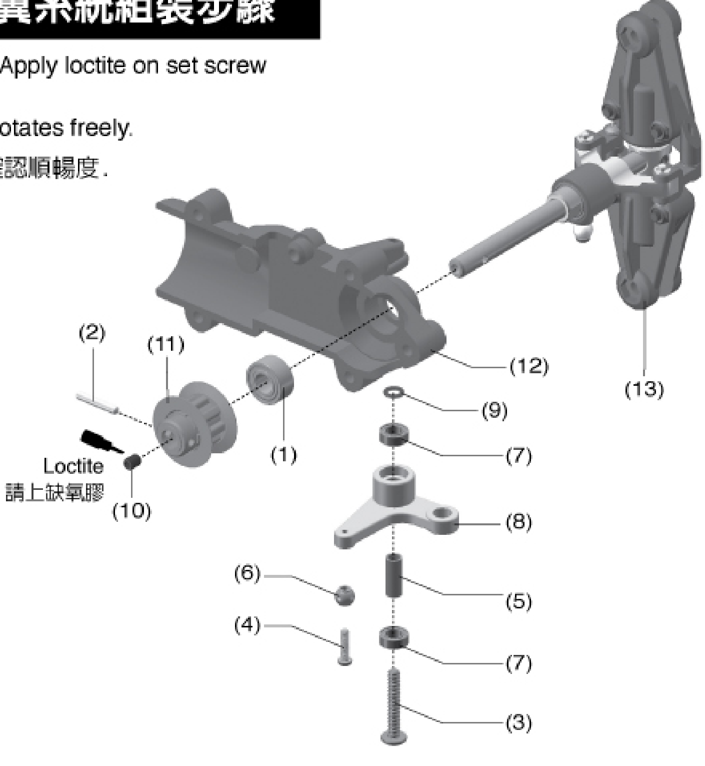
Warning / 警告
Please note the assembling direction of the angular bearing. If they are not assembled properly as illustrated, they will easily fail and result in unexpected danger.
請注意尾部斜角滾珠軸承安裝方向。若安裝錯誤，尾部機構將失效並產生不可預期的危險。



⑮ Tail Unit Assembly 尾旋翼系統組裝步驟

Secure the pulley by pressing the pin into the tail rotor shaft. Apply loctite on set screw then secure the pin with the set screw in place firmly.
Secure the tail pitch control lever just tight and make sure it rotates freely.
確實的將皮帶驅動輪與固定銷壓入尾旋翼軸內請依圖組裝後確認順暢度.

(1) HMV1150ZZSY Bearing 軸承(d5xD11xW5)..............................1
(2) HMY2-12 Pin 軸承滾針(2x12)...1
(3) HSE3-18B Self Tapping Screw 扁圓型自攻螺絲(M3x18)...........1
(4) HMF2-8N Screw 圓頭十字螺絲(M2x8)..1
(5) BK0076 Collar 軸環(3x4x10)...1
(6) BK0075 Link Ball 連接頭..1
(7) HMV740ZZY Bearing 軸承(d4xD7xW2.5)..................................2
(8) BK0024 Tail Pitch Control Lever 尾旋翼控制桿..........................1
(9) BK0088 Flat Washer 墊片..1
(10) HME3-4B Set Screw 無頭內六角螺絲(M3x4)...........................1
(11) BV0897 Metal Tail Pulley 金屬尾驅動輪...................................1
(12) BK0047 Tail Unit Housing (R) 尾座(右)...................................1
(13) Tail Unit Assembly 尾旋翼組



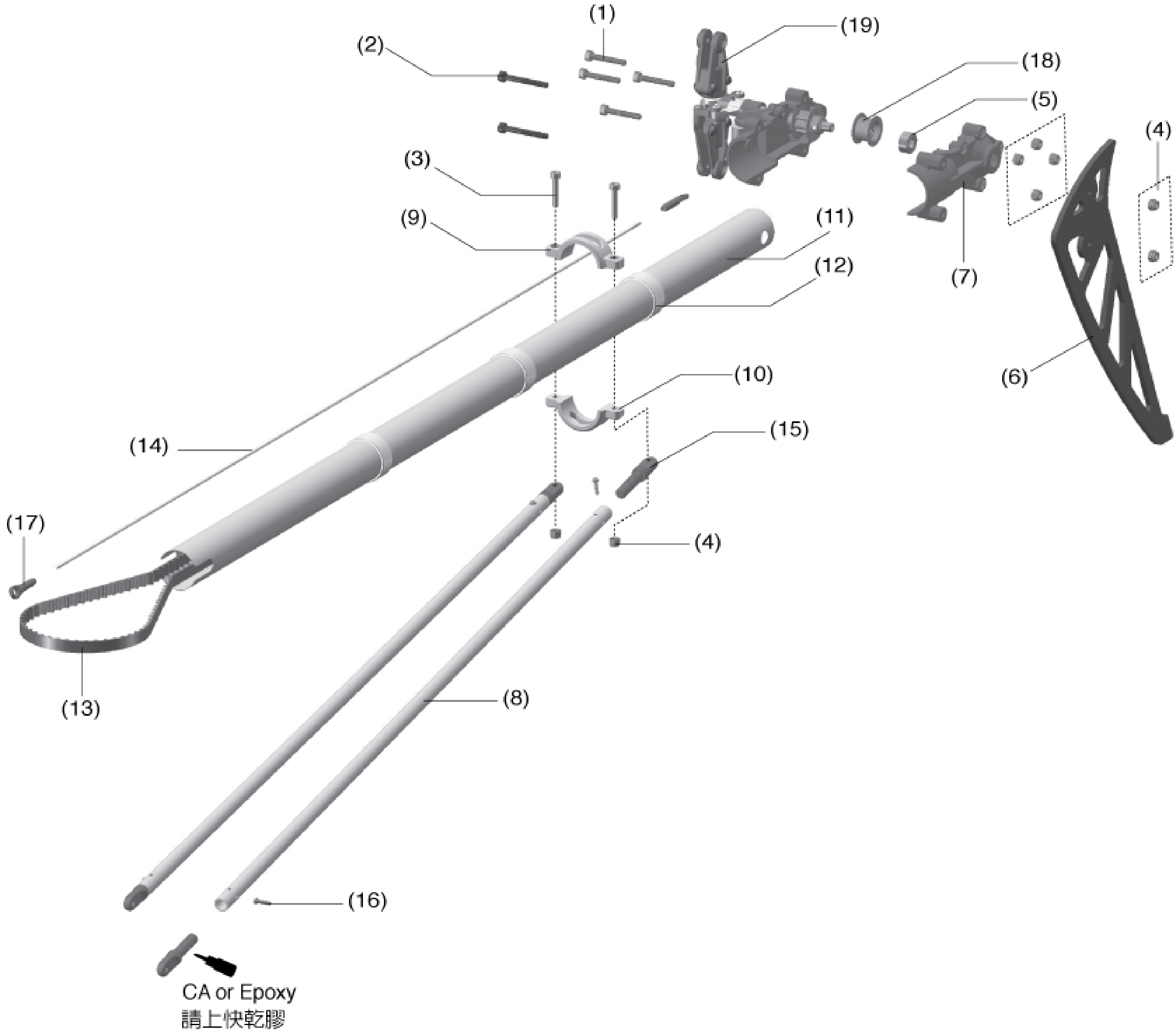
⑯ Tail Boom Assembly 尾管組裝步驟

Slide the 3 rod guides onto the boom and space them out evenly as shown. Then slide the tail linkage rod into the rod guides. Next, insert the tail rotor drive belt into the boom so that it comes out at both ends. Place drive belt over tail drive pulley and complete balance of tail boom assembly. Remember to connect the tail linkage rod to the tail control lever. Apply thick CA or Epoxy when installing tail support rod end.

組裝尾管的步驟：先將推桿固定環穿入尾管，再穿入尾舵推桿以及皮帶，之後再進行尾齒輪箱的組裝工作。

組裝時需注意：
1.時規皮帶不可以有繞纏的現象，同時需確認傳動方向正確。
2.推桿固定環必須調整為直線，以讓尾舵推桿順暢動作。
3.皮帶壓輪的固定螺絲不可以鎖死，必須讓壓輪能順暢滾動。
4.尾管固定座固定螺絲不需要先鎖死，待接入機身後再固定。

(1) HMC3-20B Socket Screw 內六角螺絲(M3x20)................................ 4
(2) HMC3-25B Socket Screw 內六角螺絲(M3x25)................................ 2
(3) HMC3-16B Socket Screw 內六角螺絲(M3x16)................................ 2
(4) HMM3Z Lock Nut 止鬆螺帽(M3)..8
(5) HMV1150ZZSY Bearing 軸承(d5xD11xW5)......................................1
(6) BK0799 Carbon Vertical Fin 碳纖垂直安定面...................................1
(7) BK0046 Tail Unit Housing 尾座（左）...1
(8) BK0524T Tail Support Rod 尾管支撐架.. 2
(9) BK0797 Bracket (Upper) 固定座（上）...1
(10) BK0798 Bracket (Lower) 固定座（下）...1
(11) BK0859 Tail Boom 尾管..1
(12) BK0091 Rod Guide 固定環...3
(13) BK0858 Tail Rotor Drive Belt 時規皮帶..1
(14) BK0860 Tail Linkage Rod 雙頭推拉桿...1
(15) BK0447 Tail Support Rod End 尾管支撐架接頭.................................4
(16) HMJ2-8N Self Tapping Screw(M2x8) 自攻螺絲...................................4
(17) BK0086 Ball Link 單頭連接桿..2
(18) BV0895 Metal Tail Idle Pulley 金屬尾惰輪...1
(19) Tail Unit 尾旋翼系統



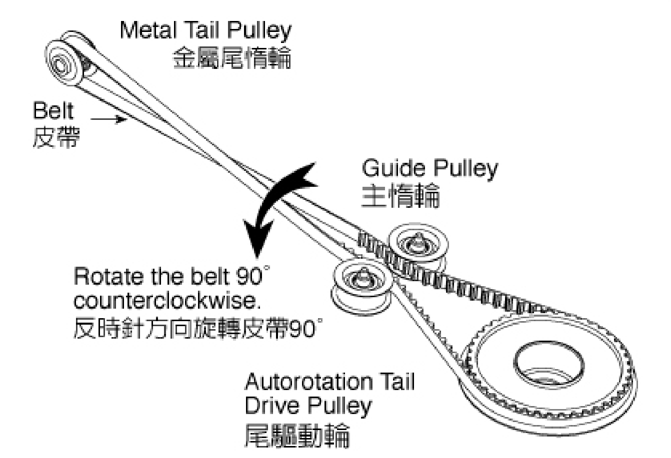
⑰ Main Frame Assembly-Part6 主側板組裝步驟-6

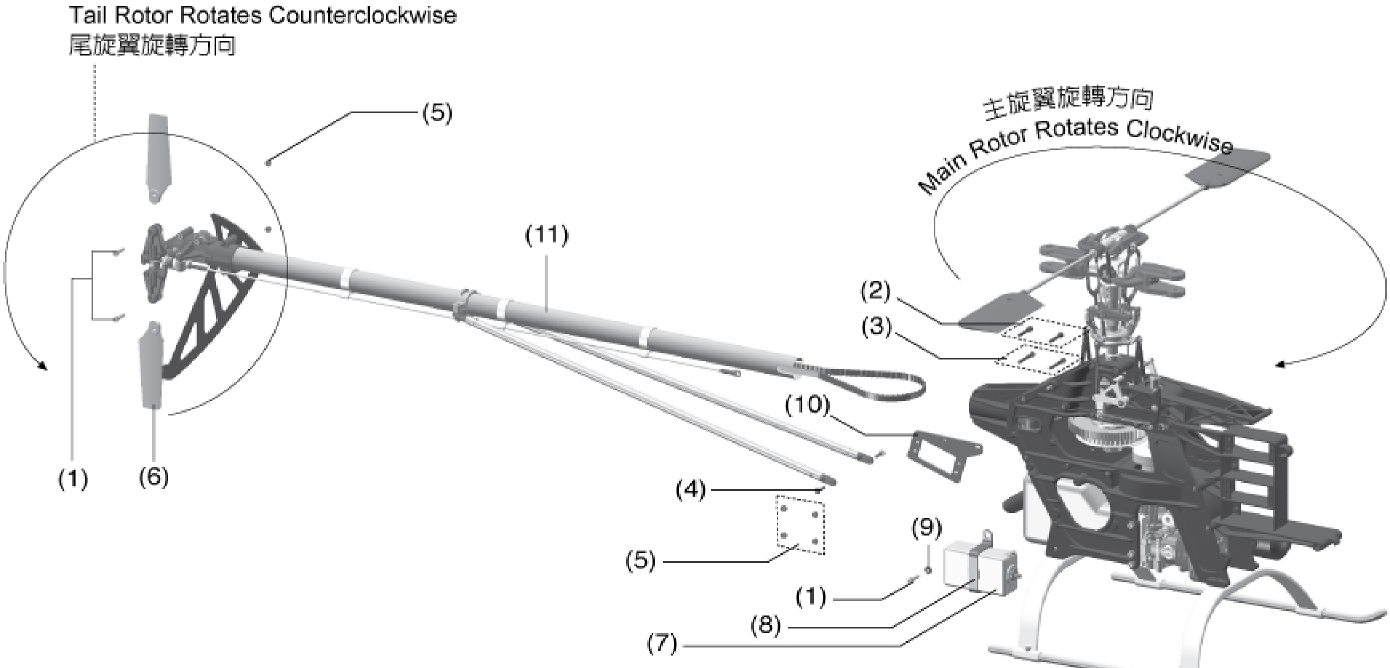
Insert the M3x20 and M3x25 socket screws into the tail base of the main frame, attach the rudder servo plate and secure them with lock nuts, do not tighten them yet. The belt must be rotated as shown below. Pull the belt through the tail base, keeping the belt correctly aligned. Push the tail boom into the tail base all the way to the end. Place the drive belt over the tail drive spur gear. Then, gently pull back on the tail boom until the tension on the belt allows no more than 5mm(3/16") of free play in the belt. Tighten the locknuts and proceed with the rest of the assembly. Install the header tank and secure the mount with socket screw, washer. Connect the fuel tube properly.

組裝順序：以M3x20及Mx25內六角螺絲穿過主側板尾管固定座孔位，將尾管及尾舵伺服機固定座安裝於主側板上， 並加上止鬆螺帽暫時固定。皮帶穿過尾管後須如圖示方向旋轉；然後將尾管推入尾管固定座至定位，再將傳動皮帶繞過尾傳動輪。接著，慢慢地將尾管向後拉緊，使皮帶間隙小於5mm(3/16")，最後將止鬆螺帽鎖緊，此部份安裝程序即告一段落。
副油箱以內六角螺絲加上墊片安裝上主側板，並正確連接油管。

(1)HMC3-14B Socket Screw 內六角螺絲(M3x14)........................3
(2)HMC3-20B Socket Screw 內六角螺絲(M3x20)........................2
(3)HMC3-25B Socket Screw 內六角螺絲(M3x25)........................2
(4)HSE3-12B Self-Tapping Screw 扁圓型自攻螺絲(M3x12).........2
(5)HMM3Z Lock Nut 止鬆螺帽(M3)...6
(6)BK0068 Tail Rotor Blade 尾旋翼...2
(7)BV0502 Header Tank 副油箱組..1
(8)BK0506 Tank Mount 副油箱固定座..1
(9)BK0087 Washer 墊圈...1
(10)BK0539 Carbon Rear Rudder Plate 碳纖維伺服機固定板......1
(11)Tail Assembly 尾管組...1

BELT INSTALLATION 傳動皮帶安裝

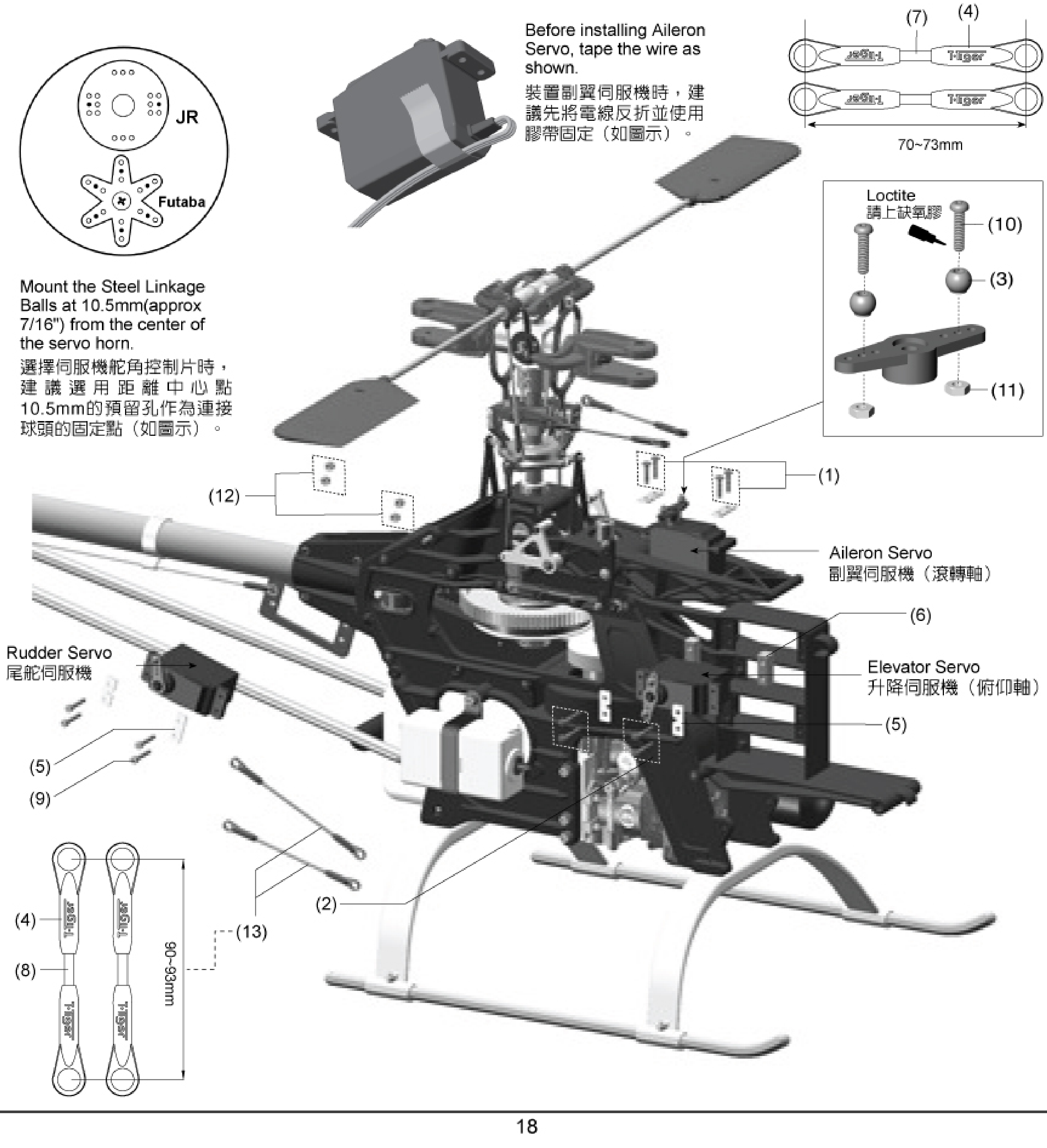




⑱ Servo Installation-Part1 伺服機的裝配步驟-1

Assembly Tip: Remove all the servo wheels prior to attaching the steel linkage balls. Ensure all linkages are the correct length.
在組裝時需注意：除了各項系統所要求的連接桿長度外，單頭連接桿在組裝時也有方向性，請將單頭連接桿的廠商標記（Mark）保持在球頭座的外側。
伺服機均附有專用的固定座銅襯（附屬於遙控器中），每一個伺服機請確實的將該銅襯裝置妥當，以免伺服機因撞擊或是震動損傷，正確的裝配方式是銅襯的凸緣必須裝置在底部的位置。

(1)HSE2612N Self Tapping Screw 扁圓型自攻螺絲(M2.6x12)..................... 4	(7)BK0840 SUS Linkage Rod SUS 連接桿(M2.3x46)..................................2
(2)HSE2620N Self Tapping Screw 扁圓型自攻螺絲(M2.6x20)..................... 4	(8)BK0845 SUS Linkage Rod SUS 連接桿(M2.3x64)..................................2
(3)BK0075 Linkage Ball 連接球頭...5	(9)HMC2516B Socket Screw 內六角螺絲(M2.5x16).....................................4
(4)BK0086 Ball Link 單頭連接桿...9	(10)HMF2-8N Screw 圓頭十字螺絲(M2x8)..5
(5)BK0104 Servo Mounting Plate 伺服機固定片...6	(11)HML2 Nut 六角螺帽(M2) 5
(6)BK0833 Servo Block 伺服機墊塊..2	(12)HMM25Z Lock Nut 止鬆螺帽(M2.5)...4



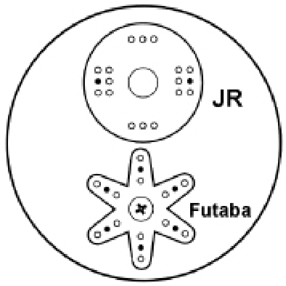
⑲ Servo Installation-Part2 伺服機的裝配步驟-2

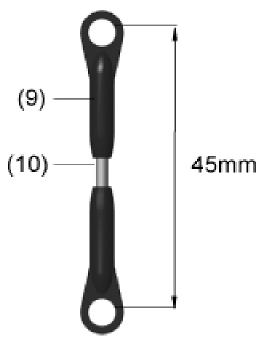
Assembly Tip: Remove all the servo wheels prior to attaching the steel linkage balls. Ensure all linkages are the correct length.
See Engine-Throttle Control Linkage in page 22.

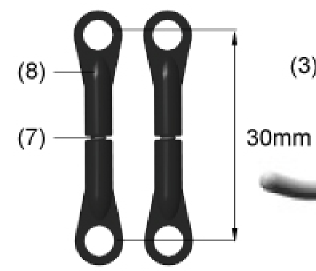
在組裝時需注意：除了各項系統所要求的連接桿符長度外，單頭連接桿在組裝時也有方向性，請將單頭連接桿的廠商標記（Mark）保持在球頭座的外側。

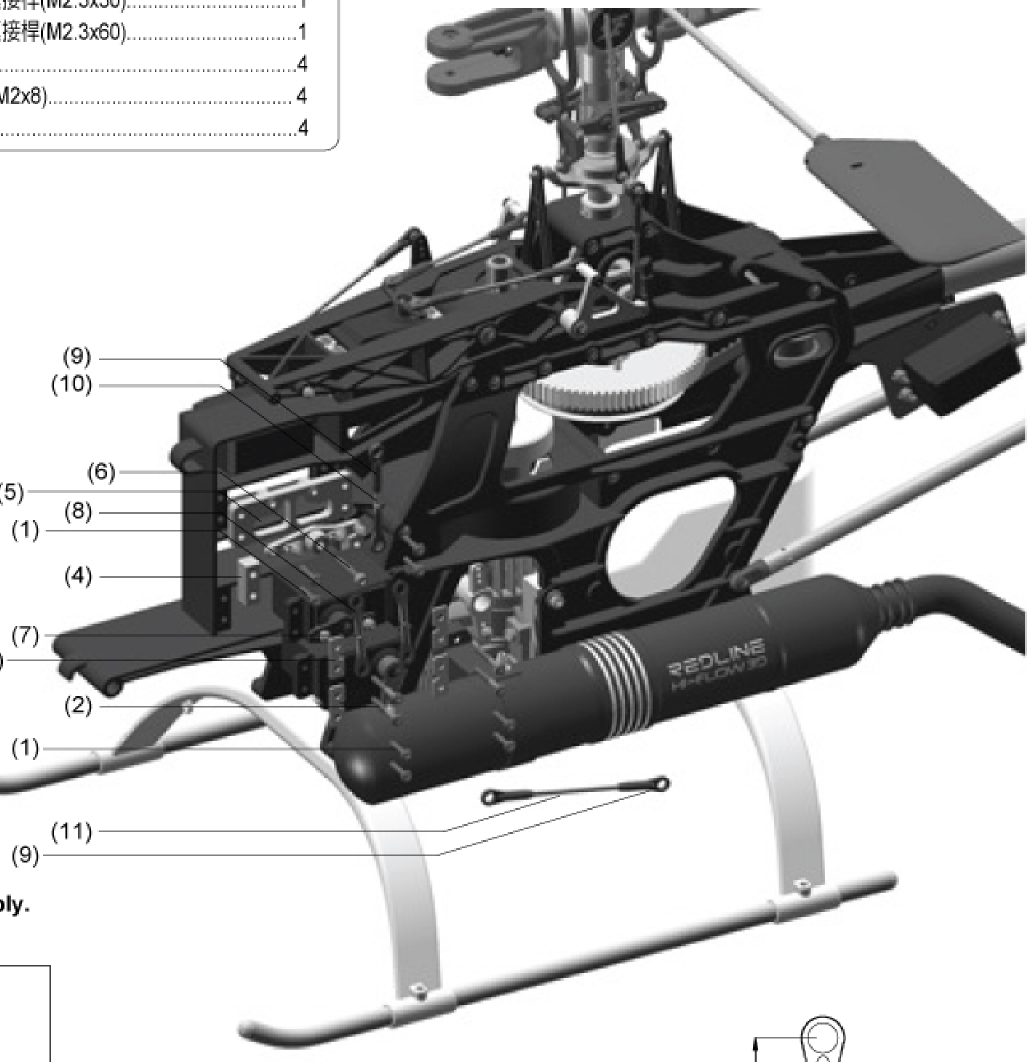
(1)HSE2612N Self Tapping Screw 扁圓自攻螺絲（細）(M2.6x12)............8
(2)HSE2620N Self Tapping Screw 扁圓自攻螺絲（細）(M2.6x20)............4
(3)BK0104 Servo Mounting Plate 伺服機固定片..4
(4)BK0833 Servo Block 伺服機墊塊..2
(5)BK0834 Pitch Lever Fixed Plate 攻角搖臂固定板...................................1
(6)HMC3-18B Socket Screw 內六角螺絲(M3x18)..1
(7)BK0113 Linkage Rod 連接桿(M2.3x18)... 2
(8)BK0085 Ball Link 球頭連桿..4
(9)BK0086 Ball Link 單頭連接桿.. 4
(10)BK0839 SUS Linkage Rod SUS 連接桿(M2.3x30)...............................1
(11)BK0841 SUS Linkage Rod SUS 連接桿(M2.3x60)...............................1
(12)BK0075 Linkage Ball 連接球頭..4
(13)HMF2-8N Screw 自攻螺絲（細）(M2x8).. 4
(14)HML2 Nut 六角螺帽(M2)...4

Mount the Steel Link Ball at 10.5mm(approx 7/16") from the center of the servo horn for the throttle arm.
選擇伺服機舵角控制片時，建議選用距離中心點10.5mm的預留孔作為連接球頭的固定點（如圖示）。

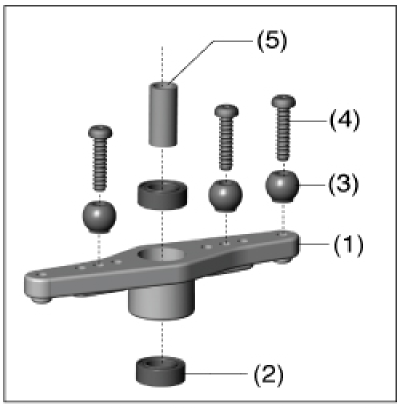






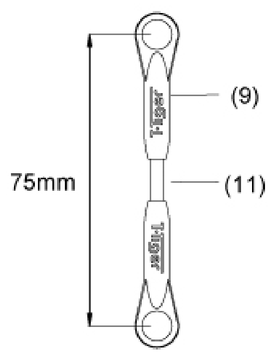


Pitch Linkage Rod Subassembly.
攻角連桿組裝



Pitch push-pull lever subassembly.
攻角雙推拉搖臂組裝步驟

(1)BK0835 Pitch Push-Pull lever 攻角雙推拉搖臂..........1
(2)HMV740ZZY Bearing 軸承(d4xD7xW2.5)................2
(3)BK0075 Linkage Ball 連接頭....................................3
(4)HMJ2-8N Self Tapping Screw 自攻螺絲（細）(M2x8)...3
(5)BK0846 Collar 軸環(d3xD4x8.5)...............................1



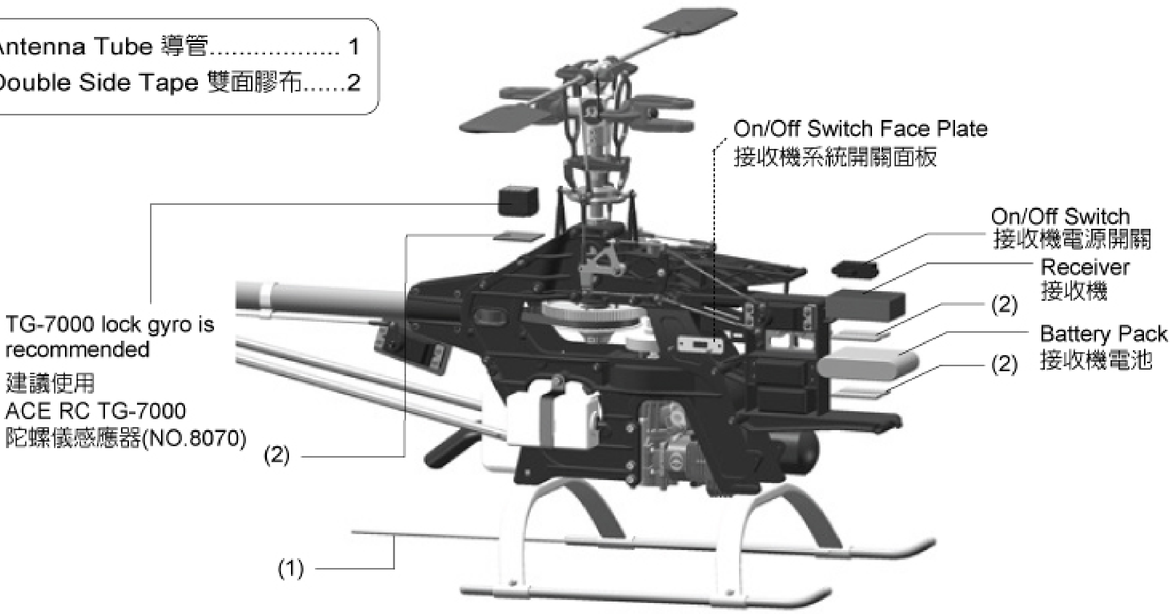
Throttle linkage Rod subassembly.
油門連桿組裝

⑳ Receiver/Gyro Installation 接收機/陀螺儀的安裝步驟

Thunder Tiger recognizes that there are many brands of radios and gyros to choose from. You are encouraged to seek the advice of experienced helicopter pilots when making this decision.

雷虎電子產品可搭配市售主流遙控系統及陀螺儀，您可詢問雷虎技授權經銷商或有經驗的玩家給予最適的搭配。

(1) BE1052 Antenna Tube 導管.................. 1
(2) BK0106 Double Side Tape 雙面膠布......2

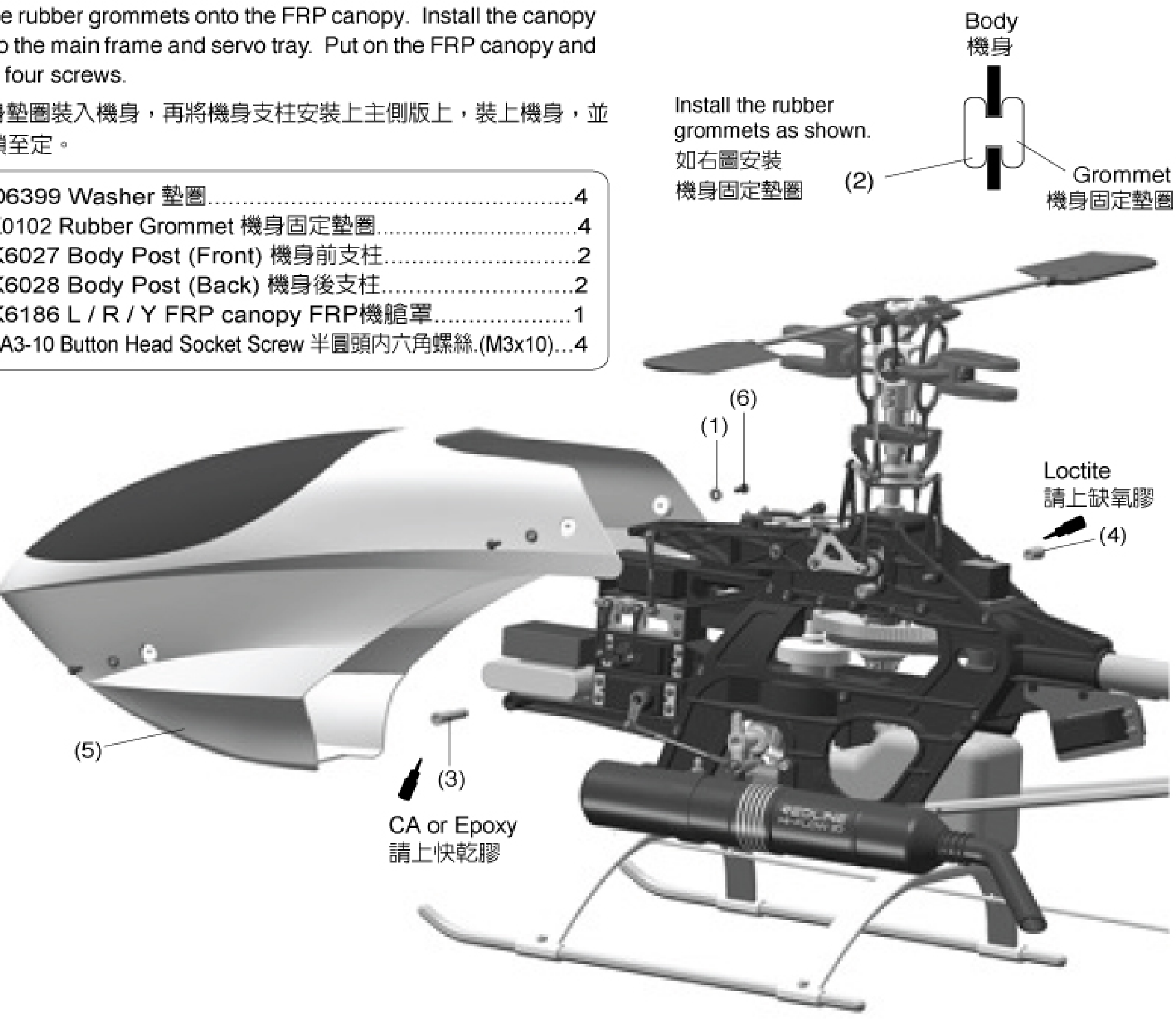


㉑ Canopy Assembly 機艙罩的組裝步驟

Install the rubber grommets onto the FRP canopy. Install the canopy post onto the main frame and servo tray. Put on the FRP canopy and fit it with four screws.

先將機身墊圈裝入機身，再將機身支柱安裝上主側版上，裝上機身，並以螺絲鎖至定。

(1) BD6399 Washer 墊圈..4
(2) BK0102 Rubber Grommet 機身固定墊圈................................4
(3) BK6027 Body Post (Front) 機身前支柱............................2
(4) BK6028 Body Post (Back) 機身後支柱............................2
(5) BK6186 L / R / Y FRP canopy FRP機艙罩....................1
(6) HSA3-10 Button Head Socket Screw 半圓頭內六角螺絲.(M3x10)...4



㉒ Main Rotor Assembly 主旋翼的組裝步驟

For F3C or 3D flying, we strongly recommend using Carbon or Fiberglass rotor blades for safety and higher performance. While Thunder Tiger takes great care to manufacture the most balanced blades available, no two rotor blades are exactly the same. It is highly recommended that you purchase a blade balancer from your hobby dealer. Follow the manufacturer's instructions for balancing the blades and install on helicopter.

本公司套件所附木質主旋翼，我們強烈建議使用在停懸練習及一般飛行。F3C及3D激烈飛行建議使用雷虎科技600mm碳纖維主旋翼及玻纖主旋翼來確保飛行安全。

由於有長期儲放脫膠的疑慮，因此主旋翼與BK0073主旋翼連接座A、BK0074主旋翼連接座B之間的上膠工作必須由使用者來進行，所需使用的環氧樹酯已經包含在套件中。
組裝主旋翼並非將它牢固的鎖緊在直昇機上，而是必須保留一點點的旋轉裕度，以供直昇機遭遇陣風時作修正之用。關於主旋翼的鬆緊度適中與否的問題，您可以請教有經驗的飛行同好幫您檢驗。

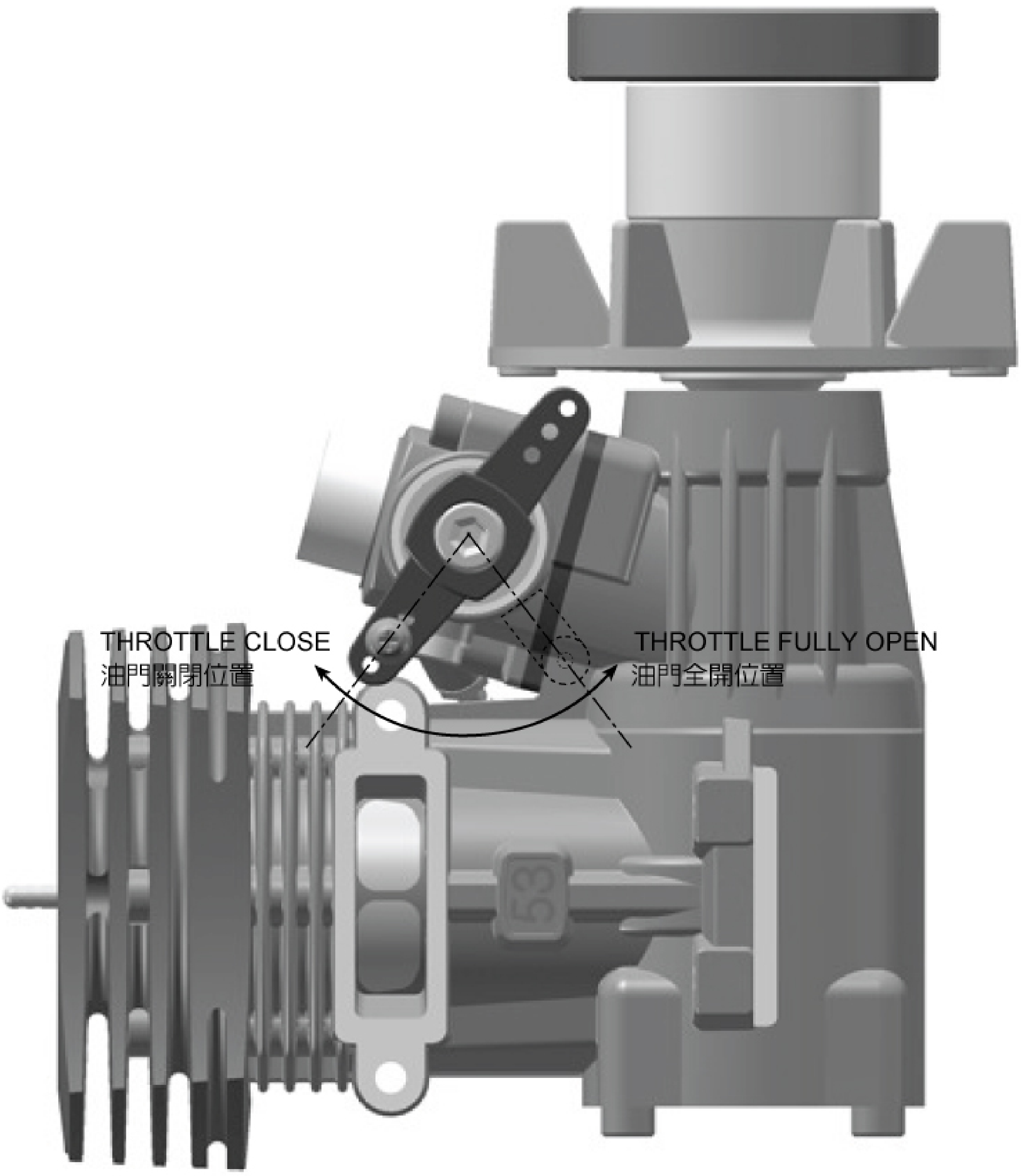
(1) BV6033 Carbon Main Blade 碳槳旋翼(600mm).........2
(2) HMM4Z Lock Nut 止鬆螺帽(M4)................................2
(3) HMC4-27B Socket Screw 內六角螺絲(M4x27)...........2



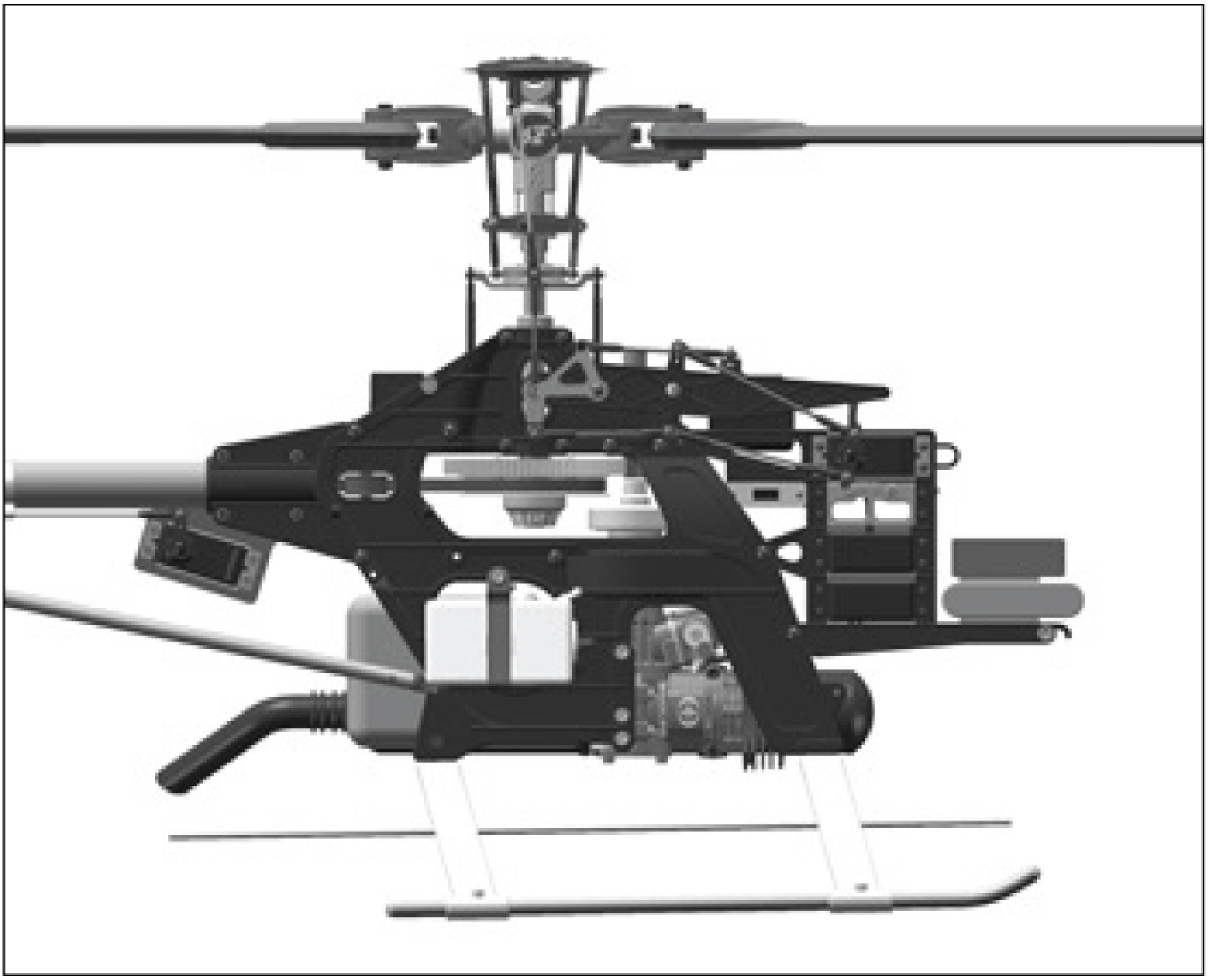
Engine Throttle Control Linkage　引擎的飛行前調整

Mount the steel linkage ball to the outer hole on the plastic throttle arm. At full throttle stick, the carburetor hole should open completely. At low throttle and with the throttle trim all the way down, the carburetor hole should close completely. Adjust the ATV function in your transmitter to achieve the above requirement. Listen to the servo, it should not make any binding noise. Try to keep the throttle ATV between 90% and 110%. If your radio does not have ATV, then adjust the location of the steel link ball on the throttle servo arm to get the correct throttle travel.

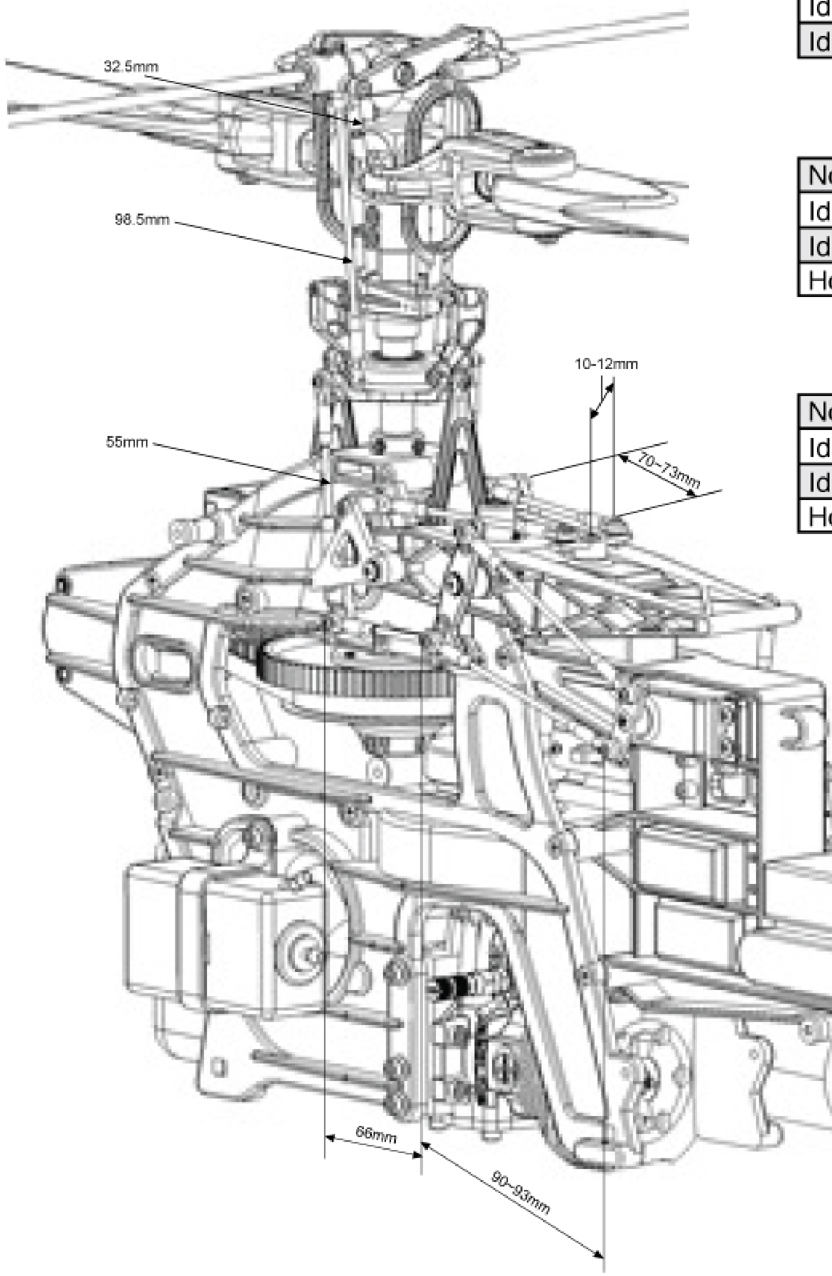
當您裝置引擎時，建議您先在化油器的節氣閥先以油性簽字筆作關閉、中速、高速位置的記號，化油器控制搖臂裝置在機身時，必須調整至與油門伺服機控制搖臂平行的位置，通常我們建議以引擎中速位置與伺服機中速位置來作相互對照的調整依據，如此各個調整點才不會因為控制與被控制機構間的不同步，發生調整上的差異。
基本上由前面所要求的各項裝置數據均能滿足使用上的需求，發生伺服機行程上的差異時，可以選擇使用遙控器上的ATV功能調整，但是我們建議調整的範圍雙邊（高、低速）不要有總合20%以上的調整差距，並儘可能的維持在90%110%的範圍內。



SET-UP SECTION　設定程序說明



Configuring The Raptor For 3D 翼手龍 50 Titan SE 3D 設定



	5-Point Throttle Curves 5點油門曲線				
Normal 正常模式	0	35	50	65	100
Idle-up1 特技模式1	100	85	60	85	100
Idle-up2 特技模式2	100	85	60	85	100

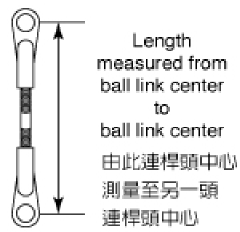
	5-Point Pitch Curves 5點螺距曲線				
Normal 正常模式	35	-	70	-	85
Idle-up1 特技模式1	10	-	-	-	90
Idle-up2 特技模式2	0	-	-	-	100
Hold 熄火降落	0	-	-	-	100

	Blade Pitch Angles (degrees) 螺距角度		
Normal 正常模式	-4	6	10
Idle-up1 特技模式1	-12	0	12
Idle-up2 特技模式2	-15	0	15
Hold 熄火降落	-15	0	15

Note / 注意

The settings may differ, the table is for your reference only.

每人操作習慣或有不同，僅供參考。



The above pushrod lengths permit 3D flying with the Raptor.
Use these lengths as a starting point. Pushrod lengths are measured from ball link center to ball link center. Suggested throttle and collective pitch set up: Idle-up1 is for continuous 3D flying and aerobatics. Idle-up2 is for those who have very good collective pitch management skills. Use a pitch gauge to check blade angles. It is easier to start setting up idle-up2 blade pitch angles first. Beginners should inhibit idle-up1 and idle-up2. Beginners should only use the normal mode values. The model should hover at around 1550 rpm in normal mode, and flies at around 2000rpm in idle-up1/2. With 1700 or higher headspeed, the use of carbon/FRP blades is recommended.

以上為翼手龍50 Titan SE直昇機之3D飛行連桿長度設定值。這些設定值可作為始設定時之參考標準。初學者亦可使用上述設定值，唯於攻角控制臂上，建議使用外側孔位，且螺距伺服機亦要以正常方式安裝。

在螺距及油門曲線設定方面，建議設定兩個特技模式。進行連續3D飛行時使用特技模式-1，而進行倒飛練習時則可使用特技模式-2。此外，建議初學者暫時不要使用特技模式進行練習。
至於轉速的設定方面，建議停懸及特技模式之轉速分別為1550rpm及2000rpm。

建議轉速高於1700rpm以上時，請將主旋翼更換為玻璃纖維或碳纖維主旋翼。切記！即便使用高性能碳纖維主旋翼，轉速仍有其上限，請參照旋翼的使用說明，切勿超轉使用。

Radio and Control Linkage Setup For Raptor 50 遙控器設定

The performance of any RC helicopter and how well it flies depends strongly on how the model has been set up. Before you start, please make up the length of all the pushrods according to the recommended length. The pushrod lengths we have provided are valid for beginners to expert 3D flying. Then, we recommend using the reset function on your transmitter to reset all settings to factory default values. Check the end point adjustment or ATV value on your transmitter to make sure the values are at 100%. Next we recommend program the numerical value we have provided in the table for the five points in the throttle curves and the collective pitch curves. Now you can proceed with mechanical adjustments.

Throttle Adjustment.

The throttle arm on the carburetor should always be parallel to the throttle servo arm. When the throttle barrel is half open, the throttle arm should be straight down. Leave it at this position. Turn on the transmitter and leave the throttle in the normal throttle mode. Set the throttle trim to the bottom and set the throttle stick to the middle. Adjust the throttle pushrod to the correct length. Check the throttle servo travel direction to confirm moving the throttle stick to the high position will move the throttle arm to the full open position. When the throttle stick is moved to the highest or the lowest position, it will fully open or fully close the throttle arm without binding.

在遙控直昇機的領域中有句老話：三分飛行，七分調整。意即一架遙控直昇機好飛與否或性能優劣，取決於調整與設定的恰當與否。為了讓消費者可以更瞭解翼手龍50 Titan SE並進行最佳之設定，本節將一步一步說明機體與遙控器的設定方式，以完全發揮翼手龍50 Titan SE直昇機的飛行性能。在開始設定之前，請按照前述之3D連桿設定長度，將機體之連桿調整至適當長度。該連桿長度適用於初學者及高階玩家。此外，建議將遙控器所有參數歸零至原廠初始值，並將所有頻道之行程量調整至100%。接下來將油門曲線與螺距曲線調整至本說明書所提供之數值，以作為初始設定。再來便可以進行更細部的設定了。

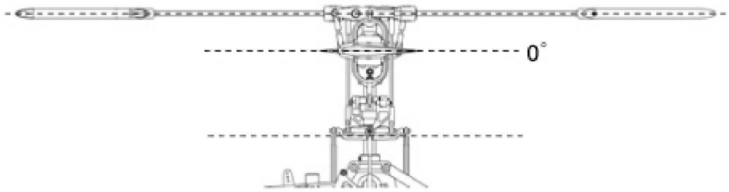
油門調整

在正常模式之下，確認油門伺服機之正逆轉，將油門微調置於熄火置，選擇適合之油門伺服機擺臂、適當之球頭孔，並調整油門連桿長度與遙控器之油門ATV值，使其正負值相近且接近100%，並使其在高速與低速的位置下確定化油器全開與全關，如此便完成油門行程之設定。在理想狀況下，引擎化油器之擺臂應該與油門伺服機之擺臂平行，而化油器開啓於中速狀態，伺服機與化油器擺臂應均是接近垂直的。

Collective Pitch Setup 螺距設定

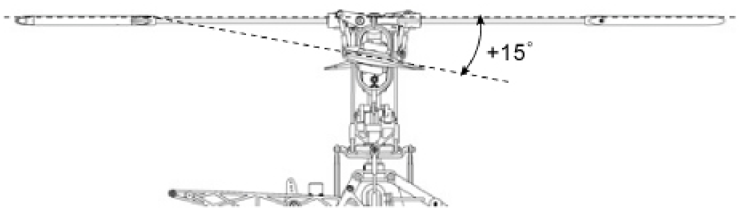
Since you have been setting the lengths of the pushrod as mentioned, the linkage should be centered well as described below.

若您已經依照前述參數設定油門對螺距曲線，連桿應會如下處於置中位置。



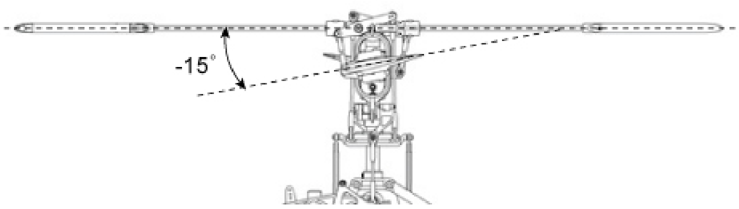
■ Centering
1. The elevator and aileron control levers should be as the drawing below while centering the collective pitch stick.
2. The flybar, the main blades should be at 0 degree and the swashplate should be level.

■ 中立點
1.當發射機螺距撥置中時，升降舵面及副翼控制搖臂位置應成水平狀態。
2.主旋翼與穩定翼平行，兩者間角度為0，且十字盤為水平狀態。



■ Maximizing
1. Place the collective stick at high end.
2. The main blades should be at +15 degree and the swashplate should be level.

■ 最大螺距設定
1.將發射機螺距撥上推至最高點。
2.主旋翼相對於穩定翼呈+15度角，且十字盤為水平狀態。



■ Minimizing
1. Place the collective stick at low end.
2. The main blades should be at -15 degree and the swashplate should be level.

■ 最小螺距設定
1.將發射機螺距撥上撥至最低點。
2.主旋翼相對於穩定翼呈-15度角，且十字盤為水平狀態。

NOTE1: The steps above defines the limits of the collective pitch setting.
NOTE2: The setting of the maximum collective pitch depends on your personal flying skill and style. Too much collective pitch could overload the engine and drive system.

說明1：上述步驟在設定主旋翼螺距的範圍值。
說明2：請依個人飛行技巧及習慣來設定最大螺距。過大的角度會增加引擎及傳動系統的負荷而縮短壽命。

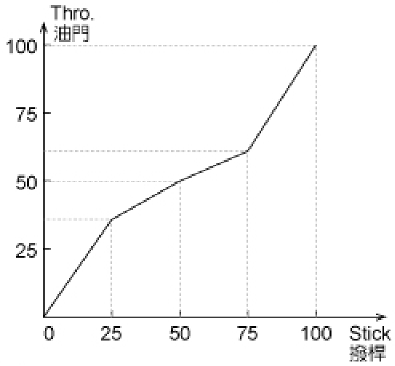
Setting Up Data For Your Reference 參數設定參考

The following is the setting up data of pitch curve and throttle curve for your reference only. Please ask experienced pilot to help you if you have never done this before.

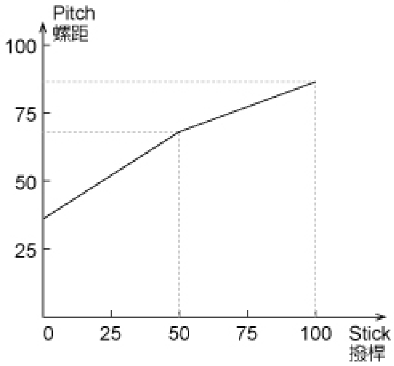
下列參數設定僅供參考，請依實際狀況進行調整，或詢求有經驗的玩家協助。

■ Beginner / 一般飛行

Throttle Curve 油門曲線



Pitch Curve 螺距曲線



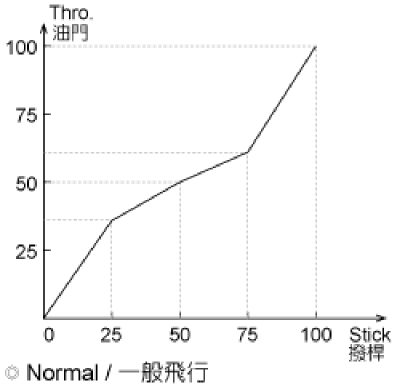
Throttle Curve 油門曲線					
	0	25	50	75	100
Normal 一般飛行	0	35	50	65	100

Pitch Curve 螺距曲線					
	0	25	50	75	100
Normal 一般飛行	35	-	70	-	85

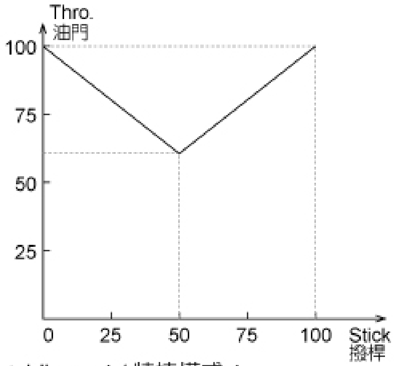
Pitch Curve 螺距曲線					
	0	25	50	75	100
Normal 一般飛行	-4°	-	+6°	-	+10°

■ 3D

Throttle Curve 油門曲線

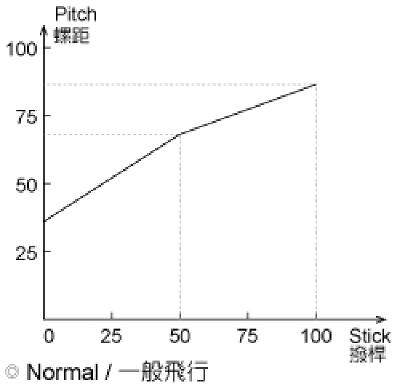


◎ Normal / 一般飛行

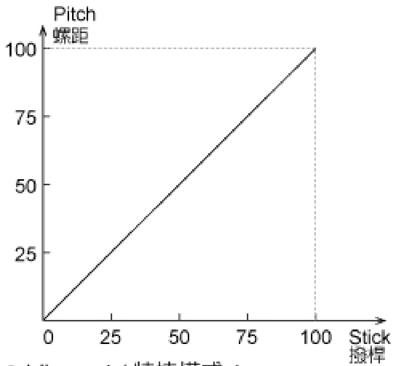


◎ Idle-up 1 / 特技模式 1

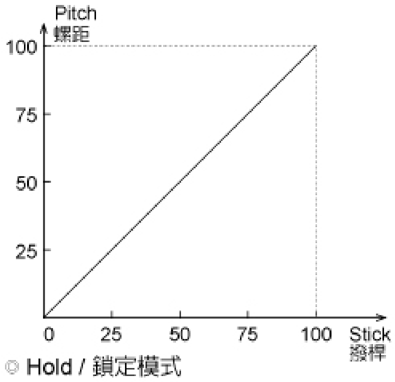
Pitch Curve 螺距曲線



◎ Normal / 一般飛行



◎ Idle-up 1 / 特技模式 1



◎ Hold / 鎖定模式

Throttle Curve 油門曲線					
	0	25	50	75	100
Normal 一般飛行	0	35	50	65	100
Idle-up1特技模式1	100	-	60	-	100

Pitch Curve 螺距曲線					
	0	25	50	75	100
Normal 一般飛行	35	-	70	-	85
Idle-up1特技模式1	0	-	-	-	100
Hold 鎖定模式	0	-	-	-	100

Pitch Curve 螺距曲線					
	0	25	50	75	100
Normal 一般飛行	-4°	-	+6°	-	+10°
Idle-up1特技模式1	-15°	-	-	-	+15°
Hold 鎖定模式	-15°	-	-	-	+15°

⚠ WARNING 警告

1. Too much collective pitch will bring about too much loading to the engine and drive system.
2. Too much headspeed will result in blades (grips) explosion.
3. It's very dangerous for setting the headspeed over the blades (grips) limit.
4. Please do not set the collective pitch to the maximum (±15°) unless you have very good collective pitch management skill.

1.過大的聚合螺距設定會使引擎及傳動系統超載。
2.過快的主旋翼轉速會造成主旋翼轉座崩裂或射槳。
3.將旋翼轉速設定超過槳片負載極限極端危險!
4.請勿將聚合螺距設定超過最大值（+15度角）。

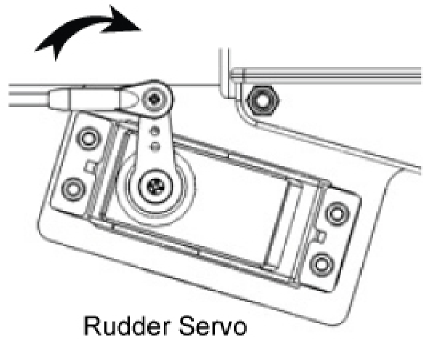
Tail Control And Gyro Setup 尾舵控制及陀螺儀控制

It is recommended to use a Heading Hold Gyro. With a Heading Hold Gyro, you may not use the trim and the revolution mixing function of tail control.
First, choose the length of the tail servo arm referring to the manual of the Gyro. You may try 13.5mm as the starting setting. Then mount the servo arm for the moment and check the movement of the tail servo:

1. While giving right rudder control, the servo arm should move toward the nose of the helicopter.
2. Rotate the helicopter with your hand counterclockwise, the servo arm should move toward the nose of the helicopter.

建議搭配鎖頭式陀螺儀，可使您無需額外設定微調及混控功能來控制尾舵。
首先，參考陀螺儀說明書來選用尾舵伺服機擺臂長度，建議初始可先設定為13.5mm。暫將伺服機擺臂固定後進行尾舵伺服機作動確認：
1.執行右舵時，伺服機擺臂應朝機頭方向作動。
2.將整台直昇機逆時針旋轉時，伺服機擺臂應朝機頭方向作動。

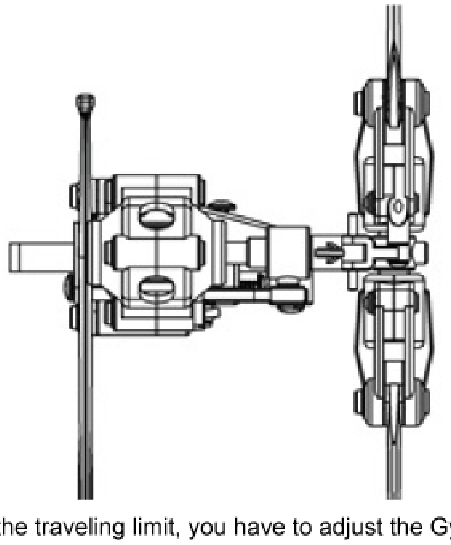


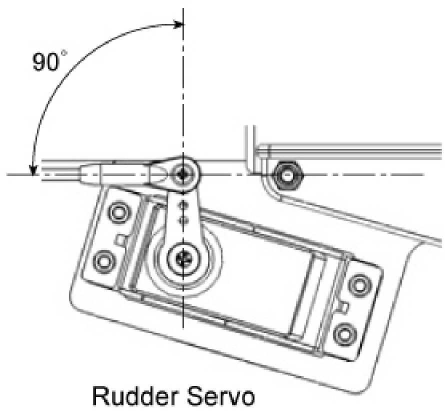


After making sure of moving direction of tail servo, you have to mount the servo arm in the correct position. Please reset the receiver power and do not move the helicopter. While the tail control stick and trim are centered, mount the servo arm vertically. If you cannot mount the servo arm vertically, please try another servo arm. Next, two points need particular attention:

1. The traveling limit of the rudder servo must not go beyond the mechanical movement.
2. The rudder servo arm should be vertical while the tail rotor is at 0 pitch or with a little offset to the right. (Referring to the photo below)

確認尾舵伺服機動作正確後，即可將伺服機擺臂確實安裝固定；請勿移動直昇機並重新啓動接收機電源。
尾舵撥桿與微調置中時，將伺服機擺臂垂直尾管安裝固定。若無法正確垂直，請更換合適的擺臂。接著，請特別注意下列兩者：
1.尾舵伺服機最大行程量切勿大於機械行程量。
2.尾舵旋翼螺距為0或稍偏向右時，尾舵伺服機擺臂應在垂直位置。（請對照下圖）





Note1: To find the traveling limit, you have to adjust the Gyro referring to its manual.
Note2: To adjust the pirouetting speed of the helicopter, please use the "Travel Adjustment" or the "D/R & EXP" function of your transmitter.

說明1：請參考陀螺儀說明書調整陀螺儀以確認伺服機最大行程量。
說明2：調整尾舵自旋速度，請設定發射機上“行程設定（Travel Adjustment ）”或“大小動（D/R）、指數值（EXP）”功能。

After Flight Checklist 飛行後的檢查項目

(1) Check every screw and bolt to make sure none has loosened due to vibration.
(2) Check every rotating and movable part to ensure they still move smoothly and normally.
(3) Clean off the exhaust residue from the muffler, engine, and helicopter.
(4) Check all movable parts, such as gears, ball links, belt, etc. for unusual wear.

（1）每次飛行後必須詳細的檢查機體的各部螺絲有無鬆動情形，若發生鬆動必須確實鎖緊再進行下飛行。
（2）每次飛行後檢查每一個轉動部（含單頭連接）均能順暢的運作。
（3）排氣管、引擎、直昇機本體必須確實的清潔。
（4）檢查每一個動作部，如齒輪、球頭、皮帶等。

Trouble Shooting 異常處置

[1]The engine will not start.

* The engine starting shaft will not turn:
The engine may be flooded with too much fuel. Please remove the glow plug first, then turn the engine with the electric starter until the excess fuel spits out of the glow plug hole.
* The engine turns when the electric starter is applied, but the engine will not start:
(1) Is the glow plug working? Remove the glow plug and does the platinum coil glow red when a 1.5 volt battery is applied to the plug? If not, then the glow plug battery may be weak and old.
(2) Is the carburetor needle properly set? Please refer to the engine instruction manual for the proper needle setting.
(3) Does the throttle control arm move properly and in the correct direction according your transmitter command?
* Engine will start, but quits immediately.
(1) Use the transmitter to increase the carburetor opening slightly. The throttle stick should never exceed the 1/3 positiom when starting the engine.
(2) Try a new or different type of glow plug. There are different types of glow plugs on the market for different types of fuel and operating conditions. Seek the advice of experienced fliers and also experiment with different types of glow plugs until you find the one that suits your operating condition the best.
*Engine runs, but the helicopter will not lift off.
(1) Check the main rotor blade pitch angle, they should be set at 5.5 to 6 degrees when the transmitter throttle/collective stick is at the center position.
(2) Does the engine throttle arm move properly? The carburetor opening should be fully open when the transmitter throttle/collective stick is moved up. The carburetor opening should be nearly closed when the transmitter throttle/collective stick is moved down. And the opening should be completely closed when the transmitter throttle/collective stick is moved down and the throttle trim is also moved down.
(3) Check your engine manual for proper starting point settings. Then try again to start your engine. If smoke is excessive when adding throttle your high speed needle may be too rich. Try a few clicks turning clockwise and try again. Once proper needle settings are achieved, model should lift off effortlessly.

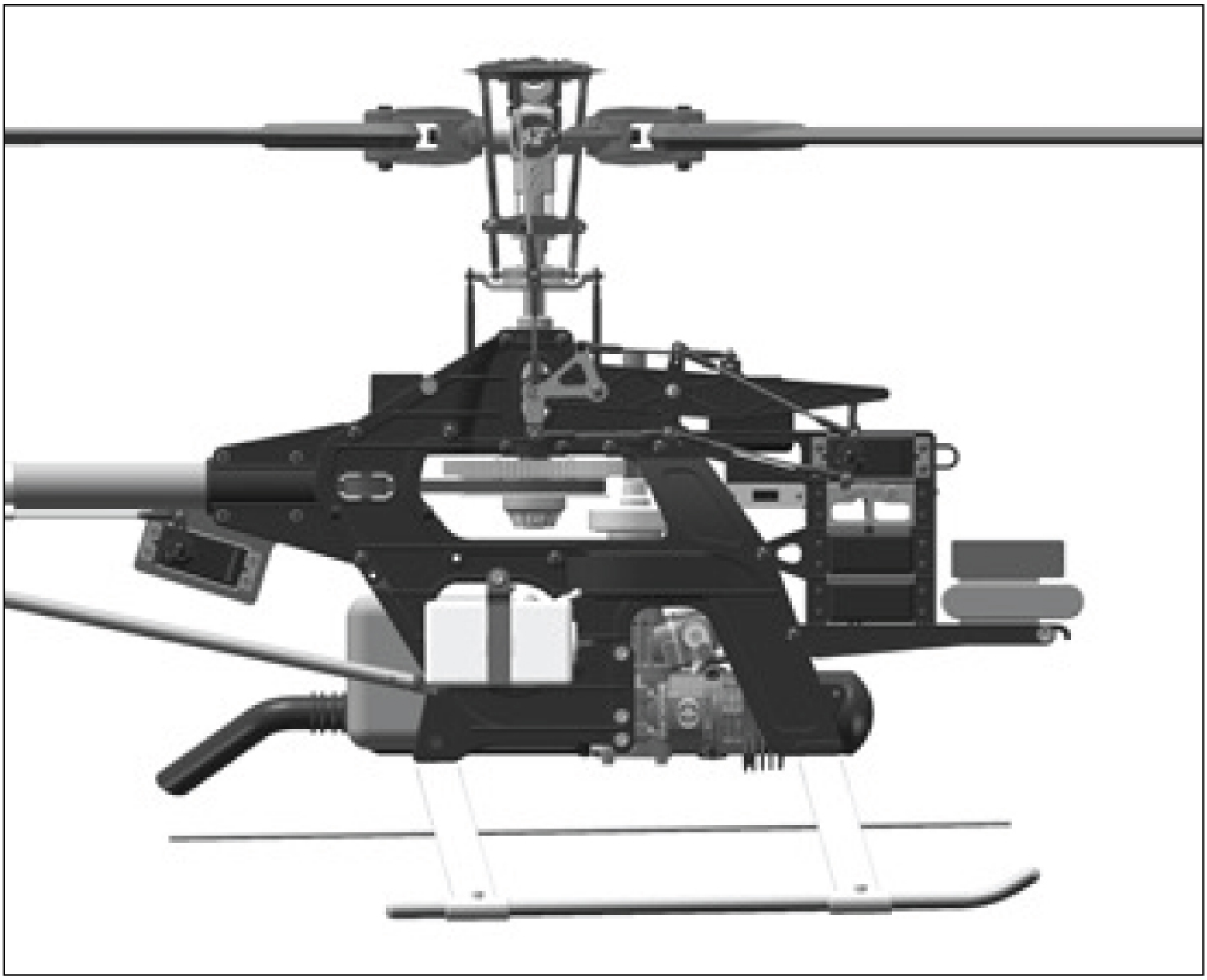
1.引擎無法啓動或無法正常起飛時：
引擎啓動軸無法轉動時：
將您的機身拆下，由前側將火星塞拆下，重複使用啓動器的程序，直到引擎內積存的燃油排出為止，再將火星塞鎖回去，重複啓動的程序。
當引擎可以轉動，但是無法順利啓動時：
1.檢查電夾是否有足夠的電源，可以將預備的火星塞接電夾上作確認，若電夾顯示正常，可能需要更換一個新的火星塞。
2.化油器的油針設定是否需要重新設定？請檢查主副油針的相關設定。
3.試著將油門微調調高或是將油門控稍微往上推，再進行啓動程序，較低的油門設定可能無法順利啓動引擎。
引擎啓動後馬上熄火的處置：
1.引擎啓動後，加速的動作稍微緩，引擎的低速油針設定的較富油時，可能會發生此狀況。
2.試著更換多種其他類型的火星塞，依據您所使用的燃油、引擎來選擇最適用的火星塞。
引擎已經啓動，但是無法正常起飛：
1.檢查主旋翼的攻角，在中速位置主旋翼的攻角應該是在5.5~6度的範圍。
2.檢查油門推在高速位置時，能夠讓節氣閥達高速的位置；低速時，節氣閥必須在接近關閉的位置。
3.化油氣的油針是否做適當的設定？先順時針旋轉將主油針關閉，再逆時針放開約2~2.5圈（此設定值請參考同好之間的設定或是各廠牌引擎的說明書建議值），引擎的排煙若是顯得較少，並有咳嗽的聲音發出，此時引擎呈現貧油的現象，必須鬆退油針；引擎顯得無力，並由消音器中噴出許多燃油時，此時引擎是處於富油的情形，必須適時的鎖進少許油針。

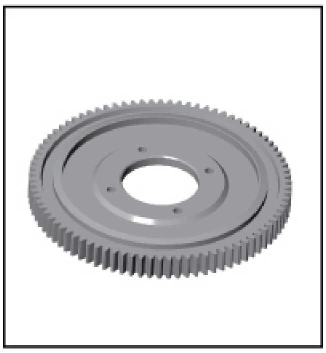
[2] Helicopter problems.

* The helicopter shakes.
(1) Is the blade spindle bent?
(2) Is the flybar bent?
(3) Is the main rotor shaft bent?
(4) Are the two control paddles mounted at the same distance from the rotor shaft, and the paddles are parallel to each other, and in the proper direction?
(5) Is the tail rotor shaft bent? The tail rotor blades mounted properly or damaged?
(6) Are the main rotor blades damaged or mounted in the proper orientation? The blades may require additional balancing. The blade balance can be checked by removing both blades and then use one of the 4mm blade bolt and nut to hold the two blades together like a teeter totter. Then, hold the blade bolt with your thumb and index finger. The two blades should teeter and remain in a level position. If not, then add some tape to the lighter blade near the blade tip until the two blades teeter in a level position. Hobby shops also sell blade balancers that are designed solely for balancing model helicopter blades.

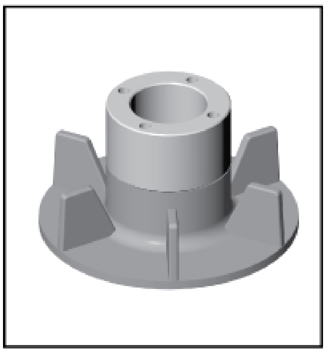
2.直昇機的問題
機體發生明顯的震動時：
1.檢查皮帶是否設定的太鬆或過緊，未正確安裝或發生反纏的現象。
2.檢查平衡是否兩端長度不一致或是彎曲。
3.檢查主軸是否彎曲。
4.檢查主旋翼兩端轉座是否跟主軸等距。在組裝旋翼頭時，若未於旋翼緩衝橡皮上油，可能會發生軸置偏移的現象，此時直昇機低速時會發生明顯的機體震動現象。
5.尾旋翼軸是否彎曲？尾旋翼轉座是否鬆動或損毀？尾旋翼是否有單邊毀損的情形？
6.主旋翼出廠前均已做過嚴謹的配對檢驗工作，但使用時仍必須再次進行主旋翼的重心、重量微調，您可以使用市售的主旋翼重心調整器來作旋翼重心的調校標準。在直昇機套件的貼紙中或主旋翼中均附有寬度約1公分的重心調整用貼紙，主旋翼裝置在重心調整器上，裁剪適長度大小的貼紙貼在較輕一端的主旋翼上，將可改善因主旋翼重心、重量不均所產生的震動問題。
7.主旋翼以及尾旋翼的鬆緊度必須一致，若有單一側較緊的情況，也可能造成機體震動。

PARTS LIST SECTION 零件包目錄





AK0148 85T Main Spur Gear
主齒輪組.85T



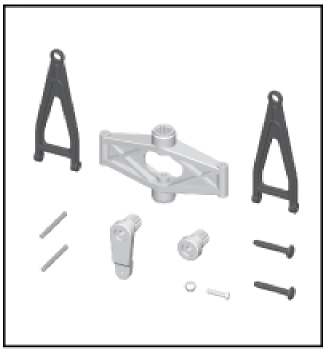
AV0143 Cooling Fan
冷卻風扇



PV0005 Flybar Control Rod
穩定翼操控環



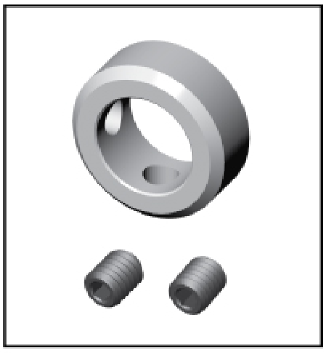
PV0012 Pitch Control Arm
攻角控制臂



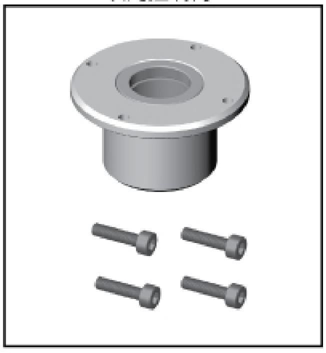
PV0013 Elevator Arm
升降組



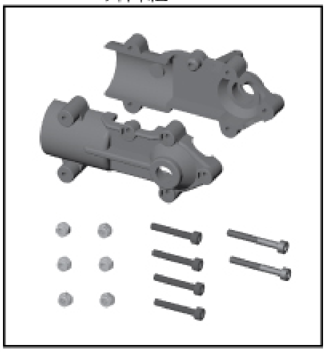
PV0016 Tail Pitch Control Lever
尾旋翼控制桿



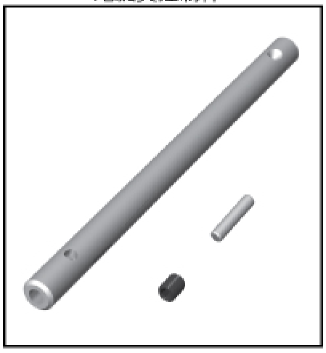
PV0018 Main Shaft Lock Ring
止檔圈



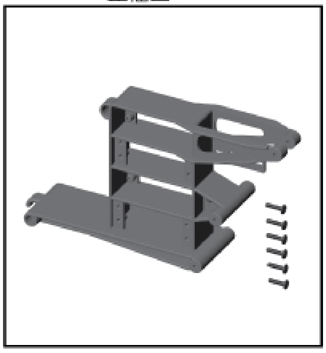
PV0019 One Way Clutch
單向離合器組



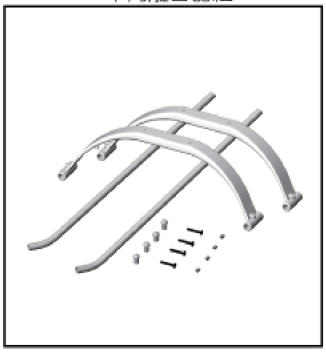
PV0027 Tail Case
尾座組



PV0030 Tail Rotor Shaft
尾旋翼軸



PV0033 Servo Tray
伺服機座



PV0035 Landing Skid Set(AL) 腳架組
PV0035-T Landing Skid Set(Titan)腳架組(鈦色)



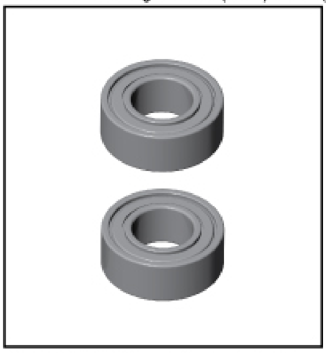
PV0037 Tail Rotor Blade
尾旋翼組



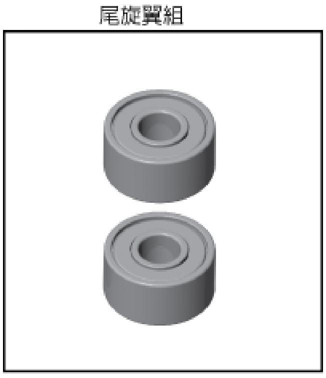
PV0040 Double Link
雙頭連接



PV0041 Ball Link
單頭連接



PV0048 Pitch Frame/ Rotor Hub Seesaw Brg.
軸承組，d4xD8xW3



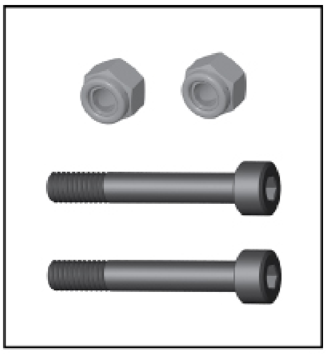
PV0049 Seesaw Brg.
軸承組，d4xD8xW3



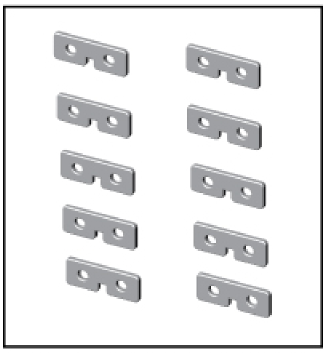
PV0051 Lever Brg
軸承組，d3xD7xW2.5



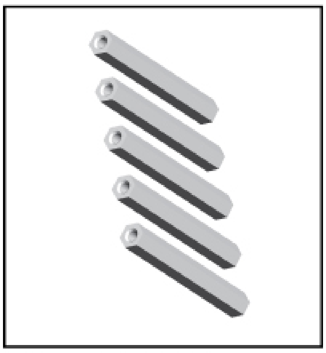
PV0052 Tail Slider Brg
軸承組，d6xD10xW3



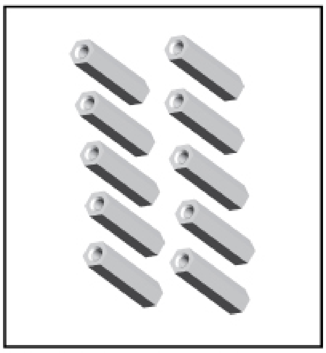
PV0053 Rotor Bolt
主旋翼螺絲組



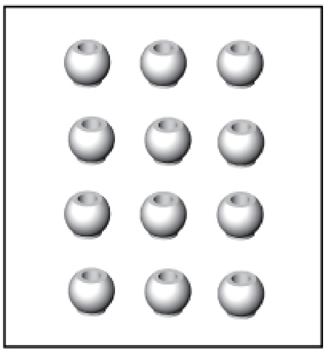
PV0054 Servo Mounting Plate
伺服機固定片組



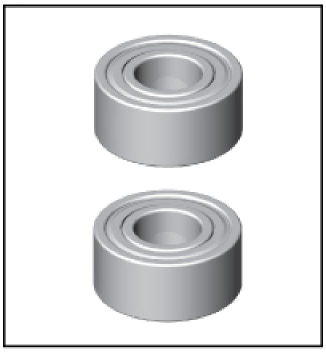
PV0056 Frame Spacer(L)
側板支柱(L)



PV0057 Frame Spacer(S)
側板支柱(S)



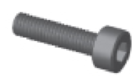
PV0058 Linkage Ball
連接頭，Ø2x12



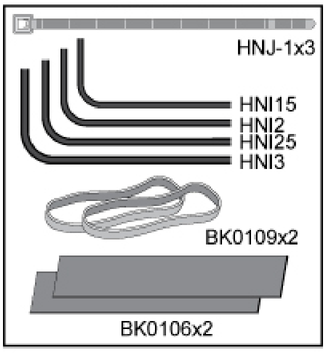
PV0059 Tail Shaft Brg.
軸承組, d5xD11xW5

	HMF2-6N M2X6 HMF2-8N M2X8
	HMJ2-10N M2X10 HMJ2-14N M2X14 HMJ2-6B M2X6 HMJ3-22B M3X22
	HSE2-10B M2X10 HSE2612N M2.6X12 HSE3-12B M3X12 HSE3-18B M3X18
	HSE3-5B M3X5

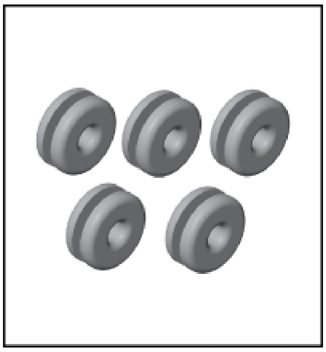
PV0088 Screw Bag (6pcs each)
圓頭十字螺絲組

	HMC3-10B M3X10 HMC3-12B M3X12 HMC3-14B M3X14 HMC3-20B M3X20 HMC3-25B M3X0.5L25 HMC3-32B M3X0.5XL32 HMC3-8B M3X8 BK0616 M3x20
	HME3-10B M3X10 HME3-18B M3X18 HME3-5B M4X5

PV0089 Screw Bag (6pcs each)
內六角螺絲組



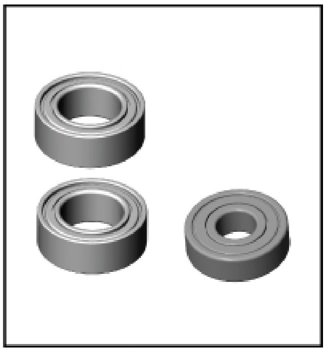
PV0060 Installation Set
組合附件包



PV0062 Rubber Grommets (White)機身固定墊圈組
PV0062-Y Rubber Grommets (Yellow)機身固定墊圈組(黃色)



PV0092 Metal Swashplate
金屬十字盤組



PV0093 Main Shaft Brg.
本體組軸承組



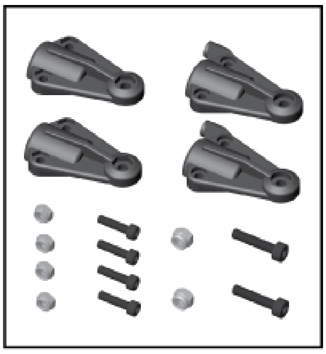
PV0107 Engine Mount (.50)
引擎固定座 (.50)



PV0114 Metal Washout Base
控制臂座



PV0115 Washout Linkage
連接座



PV0148 Tail Rotor Grip
尾旋翼轉座



PV0203 Starter Shaft Brg.
軸承組, d6xD15xW5



PV0279 Tail Rod Guide
固定環



PV0311 Header Tank
副油箱零件包，60CC



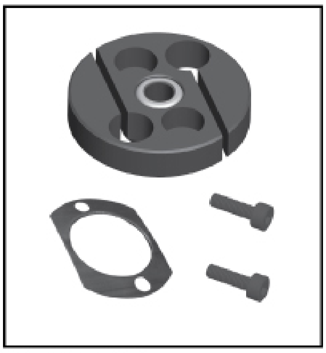
PV0312 Header Tank Support
副油箱固定座



PV0321 Carbon Rudder Servo Tray
碳纖維後置尾伺服機座



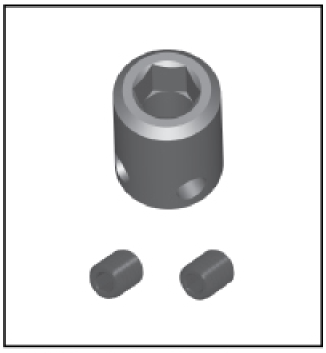
PV0355 Spindle
固定軸組



PV0359 Clutch
離合器組



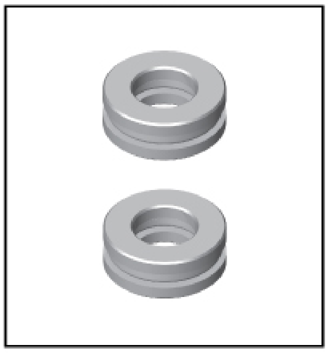
PV0360 Starter Shaft
啓動軸



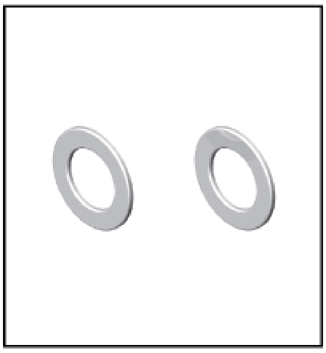
PV0361 Starter Coupling
啓動接頭



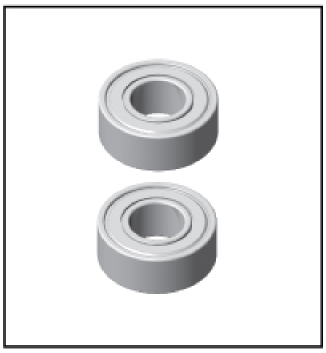
PV0363 Fuel Tank
油箱組



PV0365 Thrust Brg.
推軸承組，d6xD12xW4.5



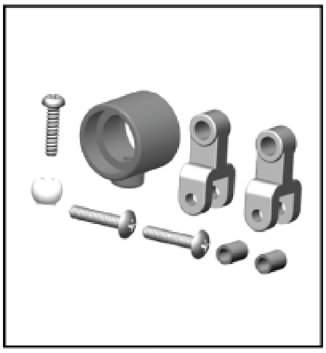
PV0372 Thrust Collar
推墊片



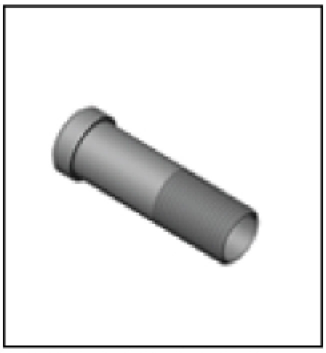
PV0373 Clutch Bell Brg.
軸承組，d6xD12xW4



PV0374 Feathering Brg.
軸承組，d6xD13xW5



PV0407 Tail Pitch Slider
尾旋翼滑座



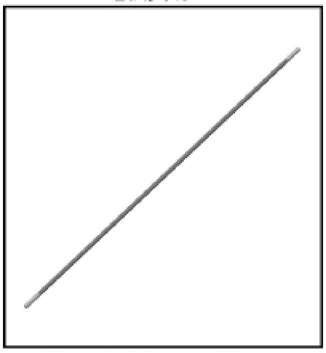
PV0425 Tail Control Bushing
尾旋翼控制軸套



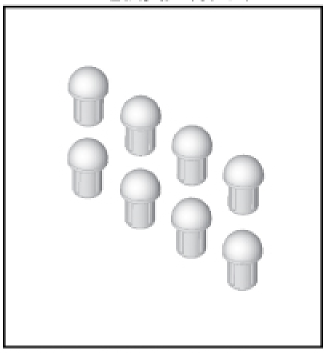
PV0439 Metal Tail Pitch Fork 尾旋翼控制座
PV0439-L Metal Tail Pitch Fork (Blue)尾旋翼控制座(藍)



PV0440 Metal Frame Spacer(s)
金屬側板支柱零件包



PV0450 SUS Flybar Rod
SUS 平衡桿零件包



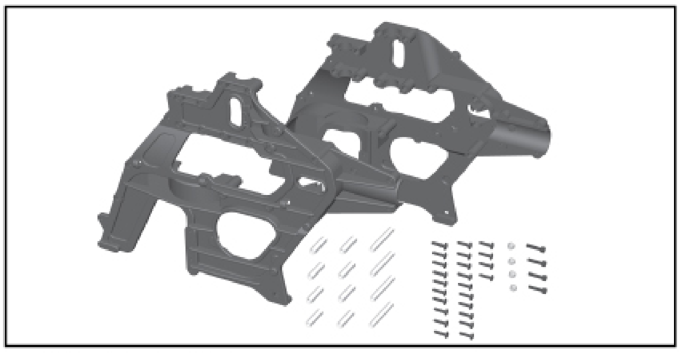
PV0454 Skid Pipe End Cap
圓管塞



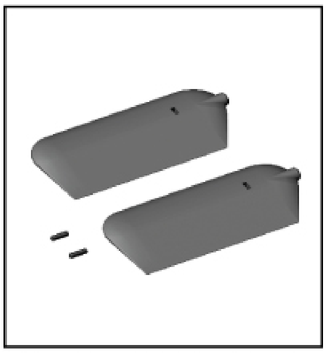
PV0457 Metal Tail Slider
金屬尾旋翼控制滑座



PV0466 Metal Tail Pitch Fork
金屬尾旋翼控制座



PV0480 Main Frame Set
側板組



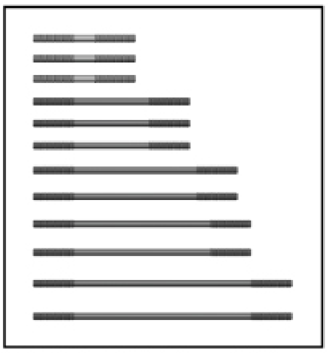
PV0482-R Ultra Light Paddle
(20g, RED)超輕量穩定翼(紅)



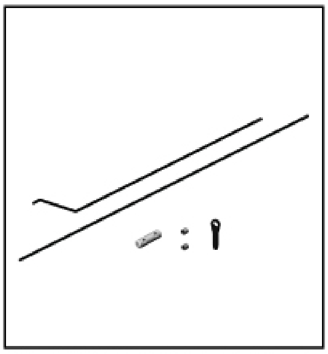
PV0499 SUS Tail Hub
SUS 尾旋翼固定座



PV0504 Tail Pitch Slider
尾旋翼滑座組



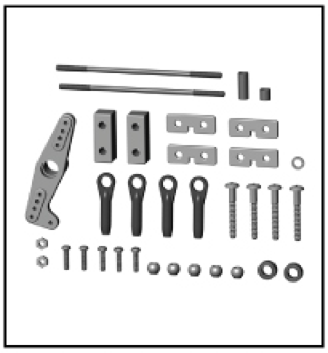
PV0505 SUS Linkage Rod
SUS連接桿組



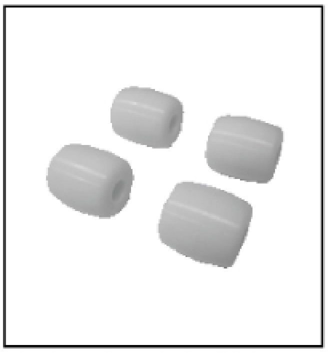
PV0507 SUS Tail Control Rod
SUS尾推拉桿



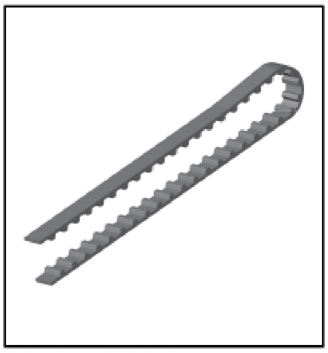
PV0509 Pitch Push Pull Lever Set
螺距雙推拉桿組



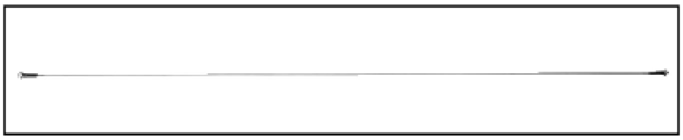
PV0510 Elevator Push Pull
Lever Set 升降雙推拉桿組



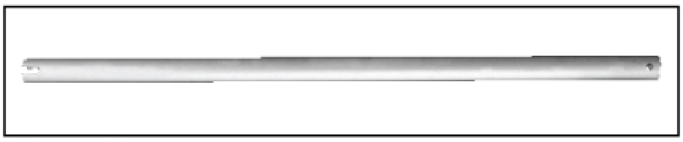
PV0512-W Skid Damper
腳架墊圈(螢光白)



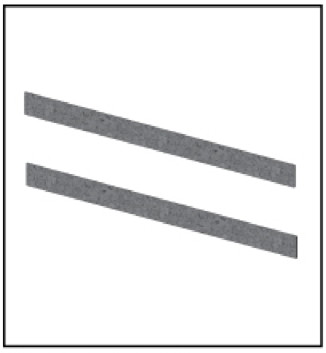
PV0520 Tail Drive Belt
時規皮帶(686XL)



PV0519 Rear Servo Rod
雙頭尾舵推拉桿



PV0521 Tail Boom
尾管



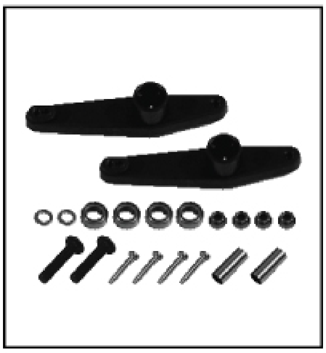
PV0532 Clutch Liner
離合器片



PV0639 Tail Rotor Angular Brg.
斜角滾珠軸承，d6xD13xW5



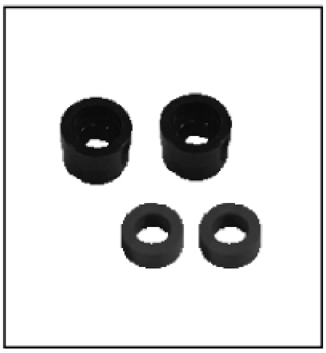
PV0651 Harden Main Shaft
強化主軸



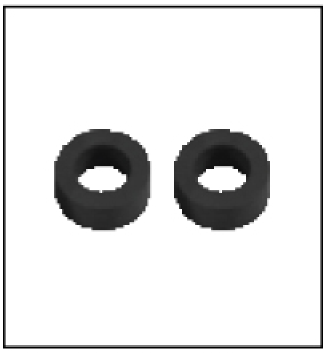
PV0652 Mixing Lever
控制搖臂

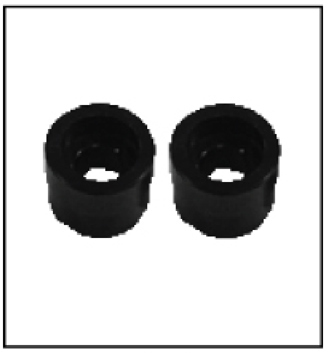


PV0656 Metal Main Rotor Hub
金屬主旋翼固定座



PV0657 3D Damper
3D 避震墊圈

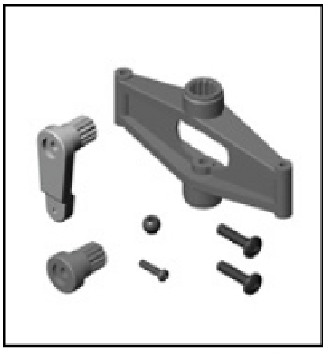

PV0658 Inner Damper
內避震墊圈


PV0659 Outer Damper
外避震墊圈


PV0660 Flybar Seesaw
穩定桿固定軸


PV0661 Flybar Control Arm
穩定翼轉臂組


PV0663 Main Rotor Grip
主旋翼轉座


PV0664 Elevator Control Base
升降控制座


PV0665 Elevator A Arm
升降舵A臂


PV0667 Aileron Lever
金屬副翼控制臂


PV0668 Guide Pulley Assy
金屬主惰輪


PV0669 Pinion Block
驅動齒輪座


PV0670 Pinion Gear 10T
驅動齒輪


PV0671 Clutch Bell
離合器罩組

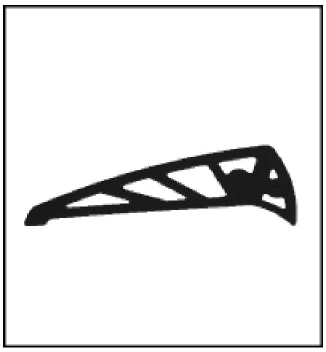

PV0672 Autorotation Tail Pulley
自動旋轉尾驅動輪


PV0673 One Way Clutch Shaft
單向離合器軸

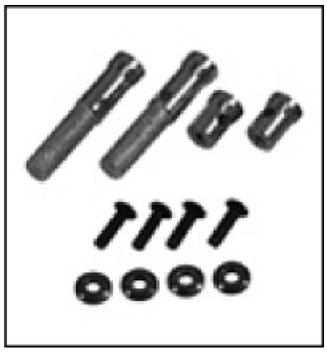

PV0674 Metal Idel Pully
金屬惰輪

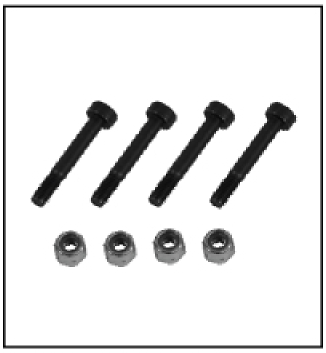

PV0675 Tail Pulley
金屬尾輪組


PV0677 Tail Support Bracket
尾支撐桿固定座


PV0678 Carbon Vertical Fin
碳纖維垂直安定面


PV0679 Tail Support(AL)
PV0679-T Tail Support(Titan)
尾管支撐架組

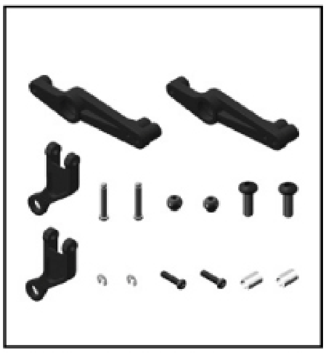

PV0680 FRP Body Post
玻纖機身支撐組



PV0681 Main Hub Bolt
主旋翼頭固定螺絲



PV0682 Main Shaft Bolt
主軸齒輪固定螺絲



PV0683 Flybar Control Lever
穩定翼控制座



PV6067-L FRP Body (Blue)
3D 機罩(藍色)



PV6067-R FRP Body (Red)
3D 機罩(紅色)



PV6067-Y FRP Body (Yellow)
3D 機罩(黃色)

Parts No. 產品編號	Description 名稱	Item No. 零件料號	Description 名稱	Quantity 數量	Reference Assemble Step 頁數
AK0148	85T Main Spur Gear 主齒輪組, 85T	BK0148	85T Main Spur Gear 主齒輪	1	7
AV0143	Cooling Fan Assy.冷卻風扇, R50	BV0143	Cooling Fan Assy. 冷卻風扇	1	10
PV0005	Flybar Control Rod 穩定翼操控制環	BK0007	Flybar Control Rod 穩定翼操控環	2	12
PV0012	Pitch Control Arm 攻角控制臂	BK0017	Pitch Control Arm 攻角控制臂	1	8
		BK0075	Link Ball 連接頭	1	8
		BK0078	Collar 軸環 (d3xD4xL4)	2	8
		HMJ2-10N	Selftapping Screw 自攻螺絲(細),M2x10	1	8
		HMJ3-22B	Selftapping Screw 自攻螺絲(細),M3x22	1	8
		HSE3-12B	Selftapping Screw 扁圓自攻螺絲(細),M3x12	1	8
PV0013	Elevator Arm 升降組	BK0018	Elevator Control Arm 升降舵控制臂	1	9
		BK0019	Elevator Arm Parallel Lever 升降舵控制臂	1	9
		BK0020	Elevator Arm Shaft 升降舵固定軸	1	8
		BK0023	Elevator Arm Linkage 升降舵連接座	2	9
		BK0075	Linkage Ball 連接頭	1	9
		BK0084	Pin 固定銷 (D2xL23)	2	9
		HMJ2-10N	Selftapping Screw,自攻螺絲(細),M2x10	1	9
		HSE3-18B	Selftapping Screw,扁圓自攻螺絲(細),M3x18	2	8
PV0016	Tail Pitch Control Lever 尾旋翼控制桿	BK0024	Tail Pitch Control Lever 尾旋翼控制桿	1	15
		BK0075	Linkage Ball 連接頭	1	15
		BK0076	Collar 軸環(d3xD4xL10)	1	15
		BK0088	Flat Washer 墊片	1	15
		HMF2-8N	Selftapping Screw自攻螺絲(細), M2x8	1	15
		HSE3-18B	Selftapping Screw,扁圓自攻螺絲(細),M3x18	1	15
PV0018	Main Shaft Lock Ring 止檔圈	BK0030	Main Shaft Lock Ring 止檔圈	1	10
		HME4-5B	Set Screw 無頭內六角螺絲, M4x5	2	10
PV0019	One Way Clutch單向離合器組	BV0033	One Way Clutch Housing Set 伺服機座	1	7
		HMC3-12B	Socket Screw, 內六角螺絲,M3x12	4	7
PV0027	Tail Case 尾座組	BK0046	Tail Unit Housing (L)尾座(左)	1	16
		BK0047	Tail Unit Housing (R)尾座(右)	1	15
		HMC3-20B	Socket Screw, 內六角螺絲, M3x20	4	16
		HMC3-25B	Socket Screw, 內六角螺絲, M3x25	2	16
		HMM3Z	Lock Nut, M3 止鬆螺帽	6	16
PV0030	Tail Rotor Shaft 尾旋翼軸	BK0053	Tail Rotor Shaft 尾旋翼軸	1	15
		HMY2-12	Pin, D2xL12 軸承滾針, Ø2x12	1	15
		HME3-4B	Set Screw, M3x4 無頭內六角螺絲	1	15
PV0033	Servo Frame 伺服機座	BK0057	Servo Frame 伺服機座	1	6
		HSE3-12B	Selftapping Screw 扁圓自攻螺絲(細),M3x12	6	6
PV0035	Landing Skid Set 腳架組	BK0064	Skid 底座圓管	2	11
		BK0065	Skid Cap 圓管	4	11
		BK0066	Skid Brace 支撐架	2	11
		HSE3-18B	Selftapping Screw 扁圓自攻螺絲(細),M3x18	4	11
		HME4-5B	Set Screw, 無頭內六角螺絲,M4x5	4	11
PV0035-T	Landing Skid Set 腳架組	BK0064T	Skid Pipe 底座圓管	2	11
		BK0065	Skid Cap 圓管	4	11
		BK0066	Skid Brace 支撐架	2	11
		HSE3-18B	Selftapping Screw,扁圓自攻螺絲(細),M3x18	4	11
		HME4-5B	Set Screw,無頭內六角螺絲,M4x5	4	11
PV0037	Tail Rotor Blade 尾旋翼組	BK0068	Tail Rotor Blade 尾旋翼	2	17
PV0040	Double Link 雙頭連接桿	BV0085	Double Link 雙頭連接	2	13
PV0041	Ball Link 單頭連接桿	BK0086	Ball Link 單頭連接桿	12	-
PV0048	Pitch Frame/ Rotor Hub Seesaw Brg. 軸承組	HMV840ZZY	Bearing, 滾珠軸承,d4xD8xW3	2	8,13
PV0049	Seesaw Brg. 軸承組	HMV830ZZ	Bearing, 滾珠軸承,d3xD8xW4	2	13

Parts No. 產品編號	Description 名稱	Item No. 零件料號	Description 名稱	Quantity 數量	Reference Assemble Step 頁數
PV0051	Leaver Brg. 軸承組	HMV740ZZY	Bearing, 滾珠軸承, d4xD7xW2.5	4	7,9,13,15
PV0052	Tail Slider Brg. 軸承組	HMV1060ZZY	Bearing, 滾珠軸承, d6xD10xW3	2	15
PV0053	Rotor Bolt. 主旋翼螺絲組	HMC4-27B	Cap Screw, 內六角螺絲,M4x27	2	21
		HMM4Z	Lock Nut, 止鬆螺帽, M4	2	21
PV0054	Servo Mounting Plate 伺服機固定片組	BK0104	Servo Mounting Plate 伺服機固定片	10	18, 19
PV0056	Frame Spacer 側板支柱(L)	BK0058	Frame Spacer 側板支柱(L)	5	6
PV0057	Frame Spacer 側板支柱(S)	BK0059	Frame Spacer 側板支柱(S)	10	6
PV0058	Link Ball 連接頭	BK0075	Linkage Ball 連接頭	12	—
PV0059	Tail Shaft Brg. 軸承組	HMV1150X	Bearing, 滾珠軸承, d5xD11xW5	2	15,16
PV0060	Installation Set 組合附件包	BE1052	Antenna Tube 油門拉桿導管	1	20
		BK0106	Double Side Tape 雙面膠布	2	20
		BK0109	Rubber Band 5x3 20xT1 耐熱橡皮圈	2	20
		HNI15	Hex Wrench 1.5m/m 六角扳手	1	3
		HNI2	Hex Wrench 2m/m 六角扳手	1	3
		HNI25	Hex Wrench 2.5m/m 六角扳手	1	3
		HNI3	Hex Wrench 3m/m 六角扳手	1	1
		HNJ-1	Tie Band 2.5x100 固定束帶	3	1
PV0062	Body Mount Rubber Grommet 機身固定墊圈組	BK0102	Body Mount Rubber 機身固定墊圈	5	20
PV0062-Y	Body Mount Rubber Grommet 機身固定墊圈組	BK0102Y	Body Mount Rubber(Yellow) 機身固定墊圈(黃)	5	20
PV0092	Metal Swash plate 金屬十字盤組	BV0092	Metal swash plate 十字盤組	1	10
PV0093	Main Shaft Bearing 本體組軸承組	HMV1680	Bearing, 滾珠軸承, d8xD16xW5	1	5
		HMV6800ZZY	Bearing, 滾珠軸承, d10xD19xW5	2	6
PV0107	Engine Mount (.50) 引擎固定座	BK0087	Washer 墊圈	4	11
		BK0144	Engine Mount 引擎固定座	1	11
		BK0179	Engine Mount Spacer 引擎定位墊片	2	11
		HMC3-14	Socket Screw, 內六角螺絲, M3x14	8	11
PV0114	Metal Washout Base 控制臂座	BK0126	Metal Washout Base 金屬控制臂座	1	7
PV0115	Washout Linkag 連接座	BK0016	Washout Linkage 連接座	2	7
		BK0171	Pin 插銷	2	7
		HMS15	E Ring E型扣環	2	7
PV0148	Tail Rotor Grip 尾旋翼轉座	BK0302-1	Tail Pitch Housing 尾旋翼座(A)	2	15
		BK0303-1	Tail Pitch Housing 尾旋翼座(B)	2	15
		HMC2510B	Socket Screw, 內六角螺絲, M2.5x10	4	15
		HMM25B	Lock Nut, 止鬆螺帽, M2.5	4	15
		HMC3-14B	Socket Screw, 內六角螺絲, M3x14	2	15
		HHM3Z	Lock Nut, 止鬆螺帽, M3	2	15
PV0203	Starter Shaft Brg. 軸承組	HMV696Z	Bearing, 滾珠軸承, d6xD15x5	2	6
PV0279	Tail Rod Guide 固定環	BK0091	Rod Guide 固定環	3	16
PV0311	Header Tank 副油箱零件包	BK0087	Washer 墊圈	1	17
		BK0102	Rubber Grommer 機身固定墊圈	1	17
		BK0506	Header Tank Support 副油箱固定座	1	17
		BV0502	Header Tank 副油箱組	1	17
		HMC3-14B	Socket Screw, 內六角螺絲, M3x14	1	17
PV0312	Header Tank Support 副油箱固定座零件包	BK0087	Washer 墊圈	1	17
		BK0102	Rubber Grommer 機身固定墊圈	1	17
		BK0506	Header Tank Support 副油箱固定座	1	17
		HMC3-14B	Socket Screw 內六角螺絲, M3x14	1	17
PV0321	Carbon Rudder Servo Tray 碳纖維後置伺服機座	BK0087	Washer 墊圈	2	17
		BK0104	Servo Mounting Plate 伺服機固定片	4	17
		BK0539	Carbon Rudder Servo Plate 伺服機固定板	1	17
		HMC2516B	Socket Screw, 內六角螺絲, M2.5x16	4	17
		HMC3-30B	Socket Screw, 內六角螺絲, M3x30	2	17
		HMM25B	Lock Nut, M2.5 止鬆螺帽	4	17

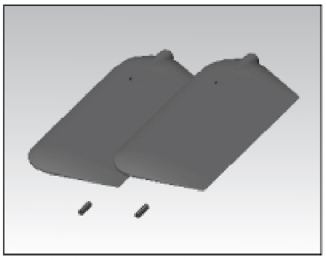
Parts No. 產品編號	Description 名稱	Item No. 零件料號	Description 名稱	Quantity 數量	Reference Assemble Step 頁數
		HMM3Z	Lock Nut, 止鬆螺帽, M3	2	17
PV0355	Spindle 固定軸組	BK0581	Flap Collar 避震軸環	2	12
		BK0583	Feathering Shaft 固定軸	1	12
		BK0435	Washer, 墊圈, d4xD11x1.7	2	12
		HMC4-8B	Socket Screw, 內六角螺絲, M4x8	2	12
PV0359	Clutch 離合器組	BK0170	Shim 離合器墊片	1	10
		BV0589	Clutch Bell Set 離合器組	1	10
		HMC3-10B	Socket Screw, 內六角螺絲, M3x10	2	10
PV0360	Starter Shaft 啓動軸	BK0592	Starter Shaft 啓動軸	1	6
		HME4-5B	Set Screw, 無頭內六角螺絲, M4x5	2	6
		HMS5	E-Clip E型扣環	1	6
PV0361	Starter Coupling 啓動接頭	BK0594	Starter Coupling 啓動接頭	1	6
		HME4-5B	Set Screw, 無頭內六角螺絲, M4x5	2	6
PV0363	Fuel Tank 油箱組	BV0605	Fuel Tank Set 油箱組	1	6
PV0365	Thrust Brg. 止推軸承組	HMX0612	Thrust Bearing 止推軸承組	2	12
PV0372	Thrust Collar 止推墊片	BK0584	Thrust Collar 止推墊片	2	12
PV0373	Clutch Bell Brg. 軸承組	HMV1260ZZY	Bearing, 滾珠軸承, d6xD12xW4	2	5
PV0374	Feathering Brg. 軸承組	HMV1360ZZY	Bearing, 滾珠軸承, d6xD13xW5	2	12
PV0407	Tail Pitch Slider 尾旋翼滑座	BK0026	Tail Pitch Control Link 尾旋翼連接頭	2	15
		BK0027	Tail Pitch Control Slider 尾旋翼控制滑座	1	15
		BK0075	Linkage Ball 連接頭	1	15
		BK0082	Collar, 軸環,d2xD3xW4.3	2	15
		HMJ2-8N	Screw, 自攻螺絲(粗), M2x8	1	15
		HSE2-10B	Self Tapping Screw, 扁圓自攻螺絲(細), M2x10	2	15
PV0425	Tail Control Bushing 尾旋翼控制軸套	BK0345	Tail Control Bushing 尾旋翼控制軸套	1	15
PV0439	Metal Tail Pitch Fork 金屬尾旋翼控制座	BK0026	Tail Pitch Control Link 尾旋翼連接頭	2	15
		BK0028	Tail Control Bushing, 尾旋翼控制軸套, R30/50	1	15
		BK0345	Tail Control Bushing, 尾旋翼控制軸套, R90	1	15
		BK0545	Metal Tail Pitch Fork (Al) 金屬尾旋翼控制座	1	15
		BK0546	Pin 插銷	2	15
		HMS15	E Ring E型扣環	6	15
PV0439-L	Metal Tail Pitch Fork (Blue) 金屬尾旋翼控制座(藍)	BK0026	Tail Pitch Control Link 尾旋翼連接頭	2	15
		BK0028	Tail Control Bushing, 尾旋翼控制軸套, R30/50	1	15
		BK0345	Tail Control Bushing, 尾旋翼控制軸套, R90	1	15
		BK0545L	Metal Tail Pitch Fork (Blue) 金屬尾旋翼控制座(藍)	1	15
		BK0546	Pin 插銷	2	15
		HMS15	E Ring E型扣環	6	15
PV0440	Metal Frame Spacer(S) 金屬側板支柱零件包	BK0136	Frame Spacer(S) 側板支柱 (S)	4	6
		HSA3-10B	Socket Screw, 內六角螺絲, M3x10	8	6
PV0450	SUS Flybar Rod SUS平衡桿零件包	BK0631	SUS Flybar SUS平衡桿	1	13
PV0454	Skid Pipe End Cap 圓管塞	BK0065	Skid Pipe End Cap 圓管	8	11
PV0457	Metal Tail Slider 尾旋翼控制滑座組	BK0075	Linkage Ball 連接頭	1	15
		BV0806	Metal Tail Slider 尾旋翼控制滑座組	1	15
		HMF2-8N	Screw, 圓頭十字螺絲, M2x8	1	15
PV0466	Metal Tail Pitch Fork 金屬尾旋翼控制座	BK0545	Metal Tail Pitch Fork (Al)金屬尾旋翼控制座	1	15
		BK0546	Pin 插銷	2	15
		HMS15	E Ring E型扣環	6	15
PV0466-L	Metal Tail Pitch Fork (Blue) 金屬尾旋翼控制座(藍)	BK0545L	Metal Tail Pitch Fork (Blue) 金屬尾旋翼控制座(藍)	1	15
		BK0546	Pin 插銷	2	15
		HMS15	E Ring E型扣環	6	15
PV0480	Main Frame Set 側板組	BK0058	Frame Spacer(L) 側板支柱 (L)	4	6
		BK0059	Frame Spacer(S) 側板支柱 (S)	8	6
		BK0599	Main Frame Left Side 左側板	1	6

Parts No. 產品編號	Description 名稱	Item No. 零件料號	Description 名稱	Quantity 數量	Reference Assemble Step 頁數
		BK0600	Main Frame Right Side 右側板	1	6
		HMC3-20B	Socket Screw, 內六角螺絲, M3x20	4	16
		HSE3-12B	Self-Tapping Screw, 扁圓自攻螺絲(細), M3x12	24	6
		HMM3Z	Lock Nut, 止鬆螺帽, M3	4	16
PV0482-R	Ultra Light Paddle (20g, Red) 超輕量穩定翼 (20g, 紅)	BK0067R	Ultra Light Paddle (20g, Red) 超輕量穩定翼(紅)	2	13
		HME3-10B	Socket Screw,無頭內六角螺絲,M3x10	2	15
PV0499	SUS Tail Hub SUS 尾旋翼固定座	BK0821	SUS Tail Hub SUS尾翼固定座	1	15
		HME3-3B	Set Screw,無頭內六角螺絲,M3x3	2	15
		HMM3Z	Lock Nut,止鬆螺帽,M3	2	15
PV0504	Tail Pitch Slider 尾旋翼滑座組	BK0025	Tail Pitch Control Fork 尾旋翼控制座	1	15
		BK0026	Tail Pitch Control Linkage 尾旋翼連接頭	2	15
		BK0027	Tail Pitch Control Slider 尾旋翼控制滑座	1	15
		BK0028	Tail Pitch Control Slide Bushing 尾旋翼控制軸套	1	15
		BK0075	Linkage Ball 連接頭	1	15
		BK0082	Collar (d2xD3xL4) 軸環	2	15
		BK0546	Pin (2mm) 插銷	2	15
		HMF2-8N	Screw ,圓頭十字螺絲, M2x8	1	15
		HSE2-10B	Selftapping Screw,扁圓自攻螺絲(細), M2x10	2	15
		HMS15	E Ring E型扣環	4	15
		HMV1060ZZY	Bearing, 滾珠軸承, d6xD10xW3)	2	15
PV0505	SUS Link Rod SUS連接組	BK0839	Linkage Rod 連接桿(L=30)	3	10,19
		BK0840	Linkage Rod 連接桿(L=46)	3	8,18
		BK0841	Linkage Rod 連接桿(L=60)	2	19
		BK0842	Linkage Rod 連接桿(L=76)	2	14
		BK0845	Linkage Rod 連接桿(L=64)	2	18
PV0507	SUS Tail Control Rod SUS 尾推拉桿組	BK0086	Ball Link 單頭連接桿	1	18
		BK0105	Tail Control Rod Joint 尾控制桿軸環	1	18
		BK0843	SUS Tail Push Pull Rod A SUS推拉桿A	1	18
		BK0861	SUS Tail Push Pull Rod B SUS推拉桿B	1	18
		HME4-5B	Set Screw, 無頭內六角螺絲, M4x5	2	18
PV0509	Pitch Push Pull Lever Set 螺距雙推拉桿組	BK0075	Linkage Ball 連接頭	5	19
		BK0085	Ball Link 單頭連接桿	4	19
		BK0086	Ball Link 單頭連接桿	2	19
		BK0104	Servo Mounting Plate 伺服機固定片	4	19
		BK0113	Linkage Rod (L=18) 連接桿	2	19
		BK0833	Servo Block 伺服機墊塊	2	19
		BK0834	Pitch Lever fixed Plate 攻角搖臂固定板	1	19
		BK0835	Pitch Push Pull Lever 攻角雙推拉搖臂	1	19
		BK0839	SUS Linkage Rod SUS連接桿	1	19
		BK0846	Collar 軸環, d3xD4x8.5	1	19
		HMC3-18B	Socket Screw, 內六角螺絲, M3x18	1	19
		HMF2-8N	Screw, 圓頭十字螺絲, M2x8	2	19
		HMJ2-8N	Selftapping Screw, 自攻螺絲(細), M2x8	3	19
		HML2	Hex Nut, 六角螺帽, M2	2	19
		HMV740ZZY	Bearing, 滾珠軸承, d4xD7xW2.5	2	19
		HSE2612N	Selftapping Screw,扁圓自攻螺絲(細), M2.6x12	4	19
		HSE2620N	Selftapping Screw, 扁圓自攻螺絲(細), M2.6x20	4	19
PV0510	Elevator Push Pull Lever Set 升降舵雙推拉桿組	BK0075	Linkage Ball 連接頭	5	18
		BK0076	Collar (d3xD4xL10) 軸環	1	8
		BK0078	Collar (d3xD4xL4) 軸環	1	8
		BK0086	Ball Link 軸環	4	8,18
		BK0088	Flat Washer 墊片	1	8
		BK0104	Servo Mounting Plate 伺服機固定片	2	18

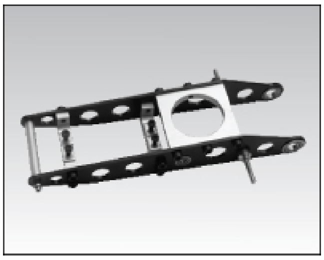
Parts No. 產品編號	Description 名稱	Item No. 零件料號	Description 名稱	Quantity 數量	Reference Assemble Step 頁數
		BK0833	Servo Block 伺服機墊塊	2	18
		BK0836	Elevator Push Pull Lever 升降雙推拉搖臂	1	8
		BK0845	SUS Linkage Rod SUS連接桿 (L=64)	2	18
		HMF2-8N	Screw, 圓頭十字螺絲, M2x8	2	18
		HMJ2-8N	Selftapping Screw, 自攻螺絲(細), M2x8	3	8
		HMJ3-22B	Selftapping Screw, 自攻螺絲(細), M3x22	1	8
		HML2	Hex Nut,六角螺帽, M2	2	18
		HMV740ZZY	Bearing, 滾珠軸承, d4xD7xW2.5	2	8
		HSE2620N	Selftapping Screw, 扁圓自攻螺絲(細), M2.6x20	4	18
PV0512-W	Skid Damper (White) 腳架墊圈(螢光白)	BK0819W	Skid Damper (White) 腳架墊圈(螢光白)	4	-
PV0519	Rear Servo Rod 雙頭尾舵推拉桿	BK0086	Ball Link 單頭連接桿	2	16
		BK0091	Rod Guide 固定環	3	16
		BK0860	Rear Push Rod, 雙頭推拉桿, 600mm	1	16
PV0520	Tail Drive Belt,時規皮帶, 686XL	BK0858	Belt ,時規皮帶, 686XL	1	16
PV0521	Tail Boom 尾管	BK0859	Tail Boom 尾管	1	16
PV0532	Clutch Liner 離合器片	BK0887	Clutch Liner 離合器片	2	5
PV0639	Tail Rotor Angular Brg 斜角滾珠軸承	HMV1050ZZO	Tail Rotor Angular Brg 斜角滾珠軸承	4	15
PV0651	Harden Main Shaft 強化主軸	BK1195	Harden Main Shaft 強化主軸	1	10
PV0652	Mixing Lever 控制搖臂	BK0893	Mixing Lever 控制搖臂	2	13
		BK0075	Link Ball 連接頭	4	13
		BK0076	Collar, 連接頭, d3xD4x10	2	13
		BK0088	Washer, 墊片, d3xD5x0.5	2	13
		HSA3-14B	Button Head Socket Screw, 半圓頭內六角螺絲, M3x14	2	13
		HMJ2-10N	Selftapping Screw, 自攻螺絲, M2x10	4	13
PV0656	Metal Main Rotor Hub 金屬主旋翼固定座	BV0793	Metal M. Rotor Hub 金屬主旋翼固定座	1	12
		BK0616	Socket Screw, 內六角螺絲 , M3x20	2	12
		HMM3Z	Lock Nut, 止鬆螺帽, M3	2	12
PV0657	3D Damper Set 3D 避震墊圈	BK0795	Inner Damper 內避震墊圈	2	12
		BK0796	Outer Damper 外避震墊圈	2	12
PV0658	Inner Damper 內避震墊圈	BK0795	Inner Damper 內避震墊圈	2	12
PV0659	Outer Damper 外避震墊圈	BK0796	Outer Damper 外避震墊圈	2	12
PV0660	Flybar Seesaw 穩定固定軸	BV0892	Flybar Seesaw 穩定桿固定軸	1	13
PV0661	Flybar Control Arm 穩定翼轉臂組	BK0002	Flybar Control Arm 穩定翼轉臂	2	13
		BK0005	Flybar Arm Bushing 轉臂六角襯套	2	13
		BK0075	Link Ball 連接頭	2	13
		HME4-5B	Set Screw, 無頭內六角螺絲, M4x5	2	13
		HMJ2-10N	Selftapping Screw, 自攻螺絲, M2x10	2	13
PV0663	Main Rotor Grip 主旋翼轉座	BK0075	Link Ball 連接頭	2	12
		BK0596	Main Rotor Grip 主旋翼轉座	2	12
		HMJ2-10N	Selftapping Screw, 自攻螺絲, M2x10	2	12
PV0664	Elevator Control Base 升降控制座	BK0018	Elevator Control Arm升降舵控制臂	1	9
		BK0019	Elevator Arm Parallel Lever 升降舵控制桿	1	9
		BK0020	Elevator Arm Control Shaft 升降舵固定軸	1	8
		BK0075	Link Ball 連接頭	1	9
		HMJ2-10N	Selftapping Screw, 自攻螺絲, M2x10	1	9
		HSE3-18B	Selftapping Screw, 自攻螺絲, M3x18	2	8
PV0665	Elevator A Arm,R30/50 升降舵A臂	BK0023	Elevator Control Arm Link 升降舵連接座	2	9
		BK0084	Pin 插銷	2	9
PV0667	Metal Aileron Lever 金屬副翼控制臂	BV0898	Metal Aileron Lever(L) 金屬副翼控制搖臂組(左)	1	9
		BV0899	Metal Aileron Lever(R) 金屬副翼控制搖臂組(右)	1	9
		BK0900	Aileron Lever Post 副翼控制臂柱	2	9
		HMC25-6B	Socket Screw, 內六角螺絲, M2.5x6	2	9
		HMF2-8N	Phillips Machine Screw,圓頭十字螺絲, M2x8	4	9

Parts No. 產品編號	Description 名稱	Item No. 零件料號	Description 名稱	Quantity 數量	Reference Assemble Step 頁數
		BK0075	Link Ball 連接頭	4	9
PV0668	Metal Guide Pulley 金屬主惰輪	BV0894	Metal Guide Pulley 金屬主惰輪	1	6
		BK0081	Pin 固定銷	1	6
		BK0036	Pulley Collar 惰輪襯套	2	6
PV0670	10T Pinion Gear 10T驅動齒輪	BK0779	10T Pinion Gear 10T驅動齒輪	1	5
PV0671	Clutch Bell 離合器罩組	BV1194	Clutch Bell 離合器罩組	1	5
PV0672	Auto-r Tail Pulley 自動旋轉尾驅動輪	BK1196	Auto-r Tail Pulley 自動旋轉尾驅動輪	1	7
		BK1197	Main Shaft Bolt 凸肩內六角螺絲	1	7
		HMM3Z	Lock Nut, 止鬆螺帽, M3	1	7
PV0673	One Way Clutch Shaft 單向離合器軸	BK1198	One Way Clutch Shaft 單向離合器軸	1	7
		BK1197	Main Shaft Bolt 凸肩內六角螺絲	1	7
		HMM3Z	Lock Nut, 止鬆螺帽, M3	1	7
		HMQ14	Snap Ring 軸用C型扣環	1	7
PV0674	Metal Idel Pulley 金屬惰輪	BV0895	Metal Idel Pulley 金屬惰輪	1	16
PV0675	Metal Tail Pulley 金屬尾惰輪	BV0897	Metal Tail Pulley 金屬尾輪	1	15
		HME3-4B	Set Screw, 無頭內六角螺絲, M3x4	1	15
		HMY2-12	Pin 固定銷	1	15
PV0677	Tail Support Bracket 尾支撐桿固定座	BK0797	Bracket (Upper) 固定座(上)	1	16
		BK0798	Bracket (Lower) 固定座(下)	1	16
		HMC3-16B	Socket Screw, 內六角螺絲, M3x16	2	16
		HMM3Z	Lock Nut, 止鬆螺帽, M3	2	16
PV0678	CB VERT. Tail Fin 碳纖維垂直安定面	BK0799	CB VERT. Tail Fin 碳纖維垂直安定面	1	16
		HMC3-25B	Socket Screw, 內六角螺絲, M3x2	2	16
		HMM3Z	Lock Nut, 止鬆螺帽, M3	2	16
PV0679	Tail Support 尾管支撐架組	BK0447	Tail Support Rod End 尾管支撐架接頭	4	16
		BK0524T	Tail Support Rod 尾管支撐架	2	16
		HMJ2-8N	Selftapping Screw, 自攻螺絲(細),M2X8	4	16
PV0680	FRP Body Post 玻纖機身支柱組	BD6399	Washer 墊圈	4	20
		BK0102	Rubber Grommet 機身固定墊圈	4	20
		BK6027	Body Post (Front) 複材機身前支柱	2	20
		BK6028	Body Post (Back) 複材機身後支柱	2	20
		HSA3-10B	Button Head Socket Screw, 內六角螺絲(半牙), M3X10	4	20
PV0681	Main Hub Bolt 主旋翼頭固定螺絲	BK0616	Socket Screw, 內六角螺絲, M3x20	4	14
		HMM3Z	Lock Nut, 止鬆螺帽, M3	4	14
PV0682	Main Shaft Bolt 主旋翼齒輪固定螺絲	BK1197	Main Shaft Bolt 凸肩內六角螺絲	2	10
		HMM3Z	Lock Nut, 止鬆螺帽, M3	2	10

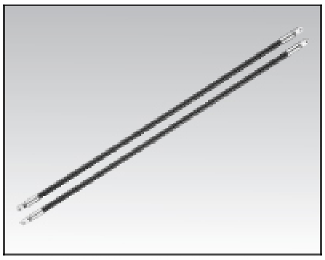
OPTIONAL PARTS 升級零件



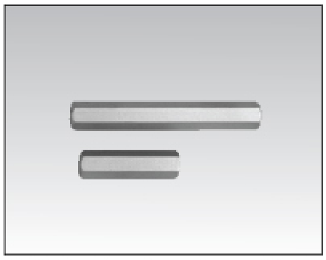
PV0036 Flybar Paddle (32g, Black)
穩定翼組



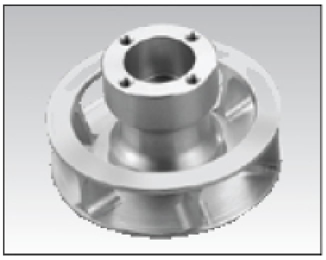
PV0068 Carbon Pitch Control Arm
攻角控制臂



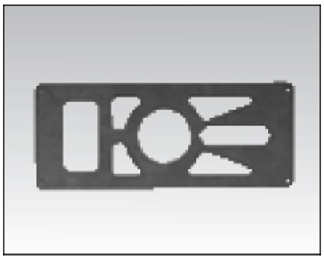
PV0103 Carbon Tail Boom Support
碳纖維尾支撐架組



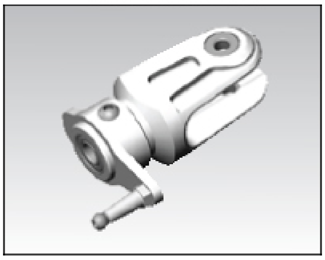
PV0104 Aluminum Frame Post
金屬側板支撐組



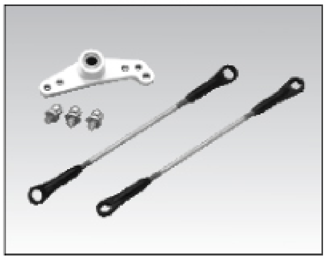
PV0106 Cooling Fan (.50)
金屬冷卻風扇



PV0326 Carbon Base Plate
碳纖底座補強板



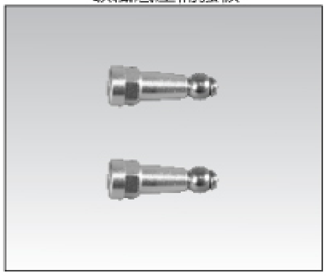
PV0339 Metal Main Rotor Grip
金屬旋翼轉座



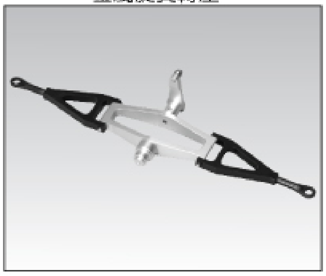
PV0349 Push / Pull Elevator Lever Set
升降雙推拉組



PV0384 Wire Clamp
電線整理零件包



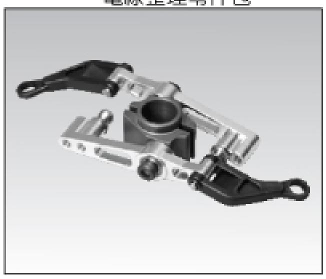
PV0399 Main Rotor Grip Post
金屬旋翼搖臂支柱



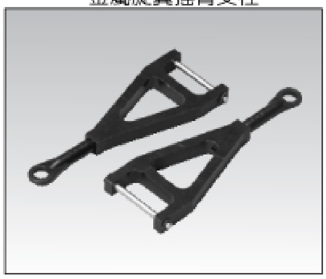
PV0441 Metal Elevator Lever Set
金屬升降舵控組



PV0444 Metal Flybar Control Arm
金屬穩定翼轉臂組



PV0445 Metal Washout Assemblly
金屬剪型臂控制組



PV0447 Elevator Arm Link
升降舵連接座



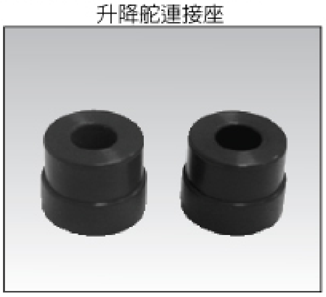
PV0448 Socket Link Ball Screw
內六角連接頭螺絲



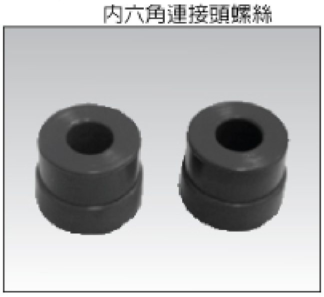
PV0449 Rotor Grip Plate Set
金屬主旋翼搖臂組



PV0482-L Ultra Light Paddle (20g, Blue)
超輕量穩定翼(藍)



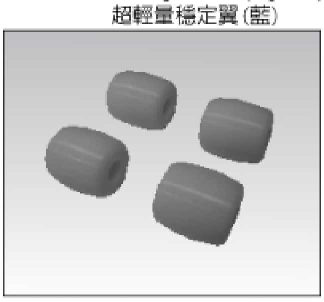
PV0381 Flap Daper (Blue, 70˚)
避震墊圈組(藍)



PV0382 Flap Daper (Red, 80˚)
避震墊圈組(紅)



PV0481 Light Paddle (25g, White)
輕量穩定翼



PV0512-Y Skid Damper (Yellow)
腳架墊圈（黃）



PV0512-L Skid Damper (Blue)
腳架墊圈（藍）

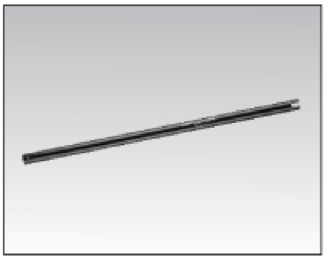


PV0513 Metal Pitch Push Pull Lever
金屬螺距雙推拉組

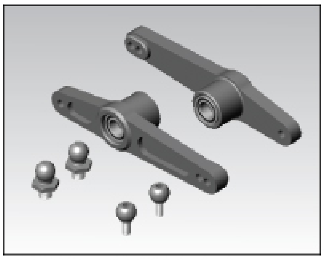


PV0514 Metal Elevator Push Pull Lever
金屬升降舵雙推拉組

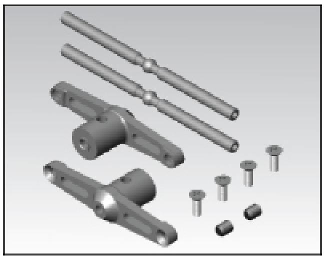
OPTIONAL PARTS 升級零件



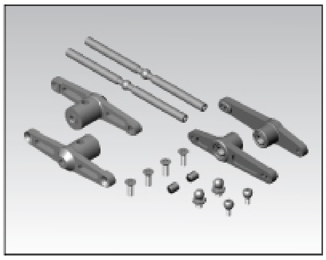
PV0523 Carbon Tail Boom
碳纖維尾管



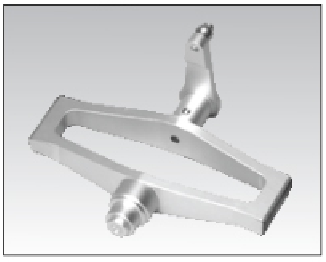
PV0653 Metal Mixing Lever
金屬控制搖臂



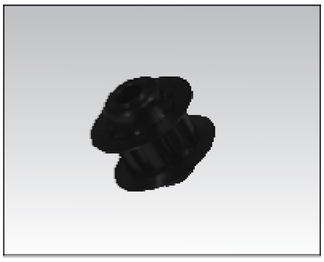
PV0654 Stabilizer Control Cage
金屬穩定翼控制框



PV0655 Stabilizer Control Cage Set
金屬穩定翼控制框組



PV0666 Metal Elevator Base
金屬升降舵座

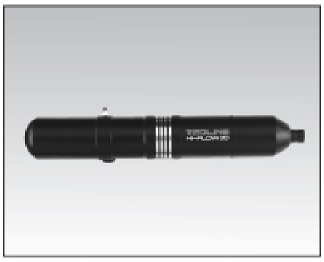


PV0676 Metal Tail Pulley (8T)
金屬尾輪組

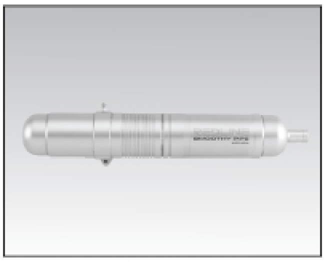
POWER 動力系統



NO. 9606 RL-53H Engine
RL-53H 直升機用引擎



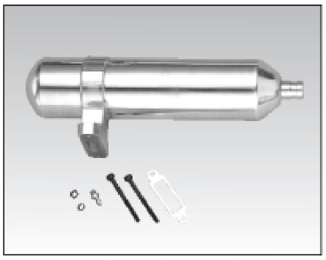
NO. 9722 RL 3D Muffler
RL 3D版 消音器



NO. 9725 RL Smoothy Pipe
RL 標準型消音器

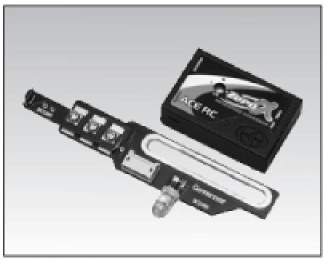


NO. 9775 Glow Plug, R3
火星塞



PV0109 Muffler (.46~.50)
消音器

ELECTRONICS 電子系統



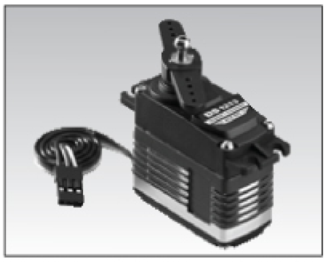
NO. 8030 Zero α Governor
Zero α 定速器



NO. 8070 Heading Lock Gyro, TG7000
TG7000,鎖定式陀螺儀



NO. 8071 TG7000, DS0606
TG7000 陀螺儀&DS0606 伺服機



NO. 8126 Digital Servo, DS1213
DS1213 數伺服機
(控制舵面用)



NO. 8130 Digital Rudder Servo, DS0606
DS0606 數位伺服機(尾舵用)

ACCESSORIES 選購配備



NO. 1382 Team Raptor Cap
Team Raptor 鴨舌帽



NO. 1383 Team Raptor Shirt
Team Raptor 制服



NO. 1384 Team Raptor Jacket
Team Raptor 外套



NO. 1389-R Neck Strap (Red)
發射機吊帶(紅)



NO. 1389-W Neck Strap (White)
發射機吊帶(白)



NO. 1645 Hand-Crank Fuel Pump
手動加油器



NO. 1658 12V Fuel Pump
電動加油器



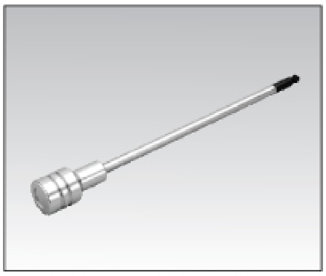
NO. 2675 12V H.D 180 Starter
DC60型 啓動器,12V



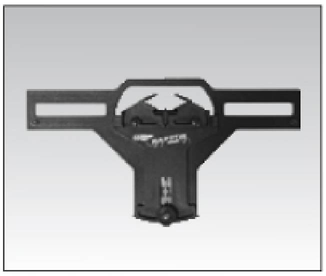
NO. 2748 12V 7.2AH Sealed Lead Acid
密閉式鉛酸電池



NO. 3800 Blade Support
主旋翼固定架



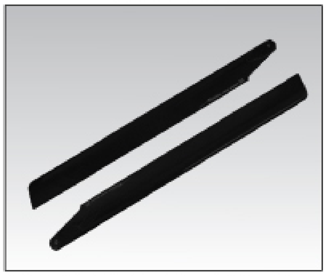
NO. 3801 6mm Starter Extension
直昇機用啓動棒



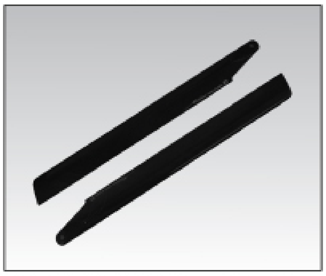
NO. 3802 Precision Pitch Gauge
旋翼攻角量規



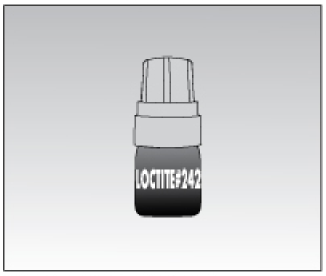
NO. 3803 Remote Glow Adapter
火星塞延長線



NO. 3875 TT V2 Carbon Blade 620mm
碳纖維主旋翼,620mm



NO. 3878 TT V2 Carbon Blade 600mm
碳纖維主旋翼,600mm



PV0267 Loctite #242
中強度防鬆劑（藍）



PV0268 Loctite #262
高強度防鬆劑（紅）



PV0270 Grease (For Bearing)
止推軸承滑油脂（黑）



NO. 1263 Carry master W/ACC,110V
NO. 1264 Carry master W/ACC,220V
NO. 1265 Carry master W/ACC,240V
啓動工具箱



NO. 2156 2.4AH GLOW STR-L,110V 2P
NO. 2157 2.4AH GLOW STR-L,230V 2P
NO. 2158 2.4AH GLOW STR-L,230V 3P
快速電夾



PV0517 Oneway Bearing Grease
單向軸承油脂